COTTON

Volume LXXIX
Number Nine
Ten Cents a Copy

AUGUST, 1915

Published Monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

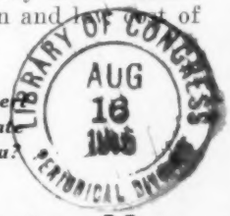
82" Main Drive Belt
Fisk Rubber Co., Chicopee Falls, Mass.
82" 3-ply belt. Length, 104 feet. Driving Pulley, 15 feet.
Receiving Pulley, 16 feet. Distance between pulley centers, 28 feet.
85 R.P.M. 4000 F.M.P. 1150 Horse Power. Installation, March, 1911.
FISK RUBBER CO., Chicopee Falls, Mass.

One Inch or Eighty-two Inch Loom Belt or Main Drive Belt. For any service and every service, G & K Belts give absolute satisfaction

Because like the Fisk 82", all G & K belts from the smallest to the largest are quality products throughout. They are carefully constructed from leather of our own tannage, tanned slowly, uniformly, and expressly for belting purposes. They possess the essential qualities of pliability, firmness with minimum stretch, great tensile strength, and durability. Lastly, they are absolutely guaranteed as to quality and workmanship.

There is a G & K belt for every drive—its use means maximum production and low cost of operation.

Our Engineering Department is thoroughly equipped to give expert assistance and advice upon any transmission problem, and to investigate and design any drive upon request. Why not let us serve you?



The Graton & Knight Mfg. Co., Worcester, Mass.

Oak Leather Tanners and Belt Makers

Branches in all Principal Cities.

THE BEST NORTHROP LOOM

BOBBINS

AND

SHUTTLES

ARE MADE BY

NORTHROP LOOM

MANUFACTURERS

LOOK FOR OUR NAME
ON YOUR

Bobbins and Shuttles

Draper Company

Hopedale Mass.

J. D. CLOUDMAN SOUTHERN AGENT

188 South Forsyth Street **ATLANTA GA.**

AUG 16 1915

©CLB338511

COTTON

Published Monthly

Volume 79. AUGUST, 1915. Number 10

L. L. ARNOLD, Editor

Publication Office, Dalton, Ga. Editorial and Advertising Departments, Grant Building, Atlanta, Ga.

Entered at Dalton, Ga., Postoffice as second-class matter. Subscription Rates: Domestic, $1.00 for Two Years; Foreign, $1.50 Per Year; Canada, $1.00 Per Year.

Complaints of failure to receive Cotton regularly or of errors of any nature relating to subscription should be promptly made to the Atlanta office.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertisements must reach Atlanta previous to the 10th of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

Copyright, 1915. W. R. C. Smith Publishing Co.

CONTENTS.

Editorial—
Take Them by the Hand and Tell Them So 419
A Result of the War 420
A Department for Development Work 420

General—
They Work and Win 421
How the Government Renders Assistance to Cotton Goods Exporters 425
Middle States Cotton Manufacturers Association 427
North Carolina A. & M. College Serures a New Textile Instructor 428
Harmony Among Overseers 428
Some Principles in Lubrication 429
The Merchandising of Southern Colored Cotton Goods 430

Mill Conditions and Market Reviews—
Southern Mill Situation 433
New England Mill Situation 434
Cotton Comment 436
The Yarn Market 436
The Knit Goods Market 437

Cotton Manufacturing—
Detecting Defective Flyers 438
Designs For Fancy Cotton Fabrics 441
A study of the Waste Pile 442

Knitting Department—
The Manufacture of Fashioned Knit Goods 445
Knit Goods in the Far East 449

Dyeing, Bleaching and Finishing—
Industrial Chemistry and the Cotton Industry 450
Direct Coppered Blues 451
Waterproofing Textile Fabrics 451
Native India Dyestuffs 452

Practical Problems Discussed by Cotton's Readers—
Feed Roll Clearers 453
How to Analyze a Stocking 453
Overcoming Looper Troubles 454
Slashing 455
Classing Cotton 456
Working Fine Combed Yarns 456

Notes About Men You Know 67
New Machinery and Trade Notes 70
Book Reviews 74
Knitting Mill News 76

TAKE THEM BY THE HAND AND TELL THEM SO.

State senators and representatives are like all other human beings, only they are, perhaps, a bit more sensitive of the plaudits of the multitude. They want your approval of the work they do during the session. They are entitled to your verdict of approval or disapproval on their work, for they are your representatives in the making of the laws within which you must live and transact your business. Not a one of them has been able to serve all of the interests of all of his constituency in all of the matters of legislation. Those whose interests he has been unable to serve will, in all probability, make their displeasure known to him either directly or indirectly. It is therefore your duty, when satisfied with the action taken, to make known to your representatives in both the house and the senate, your personal approval of their acts. It would pay you to "drive out of your way" and do it as soon after a legislative session closes as possible.

For instance, the legislature of Georgia is just now closing its annual session, and will have finished by the time this issue of COTTON is in the hands of its readers. The usual number of bills antagonistic to the manufacturing and commercial interests of that state have been introduced, most of them by request. Because of the high character and the broad views of a majority of the members of both the senate and the house, these bills did not get beyond the various committees that had them under consideration.

Two very objectionable arbitration bills were introduced, each seeking to impose between the employer and employee a committee made up of the people who knew nothing about the questions to be arbitrated, or who had any financial interest in what might result from its decision. Another case of authority without responsibility. The advocates of these bills undertook to insist before the committees that to drive a wedge between the employer and employee, absolutely separating them from each other, was the ideal means of bringing them closer together. These are but two of many bills, nearly if not equally as destructive in nature that were handled by the various committees, and be it said to the credit of the majority of the senators and representatives of that state, we are advised that not a single bill which was grossly destructive in nature to the manufacturing and commercial interests of that state, got beyond the committee rooms. The speaker of the house of representatives, Mr. Burwell, sounded the keynote, when, in a public address, a few days after the meeting of the legislature, he stated that this is not the time for destructive legislation; that the South needs capital to develop its enormous natural resources and that legislation should encourage rather than discourage the locating and operating of manufacturing plants and commercial institutions in Georgia.

Georgia cotton manufacturers, go to your representatives as soon as they get home, give them the "glad hand" and

tell them how much you appreciate their work. This is but one year, and next year and each year thereafter you need just such men to represent you and the best interests of your state.

A RESULT OF THE WAR.

An export total of approximately $75,000,000 is the indicated record of American manufactures of cotton goods in the fiscal year 1915, while imports of cotton manufactures will probably fall below $50,000,000, making the balance of trade on the export side about $25,000,000, as against an import balance in every earlier year in the country's history, save in 1905, when the excess of exports in this group was about $1,000,000.

In the ten months of the current fiscal year down to May 1, the exports of cotton manufactures, amounting to $57,900,000, have already exceeded by $4,000,000 the largest record of any complete fiscal year prior thereto. The highest level previously recorded by the Bureau of Foreign and Domestic Commerce, Department of Commerce, was $53,700,000 in 1913, and the next highest level was $52,900,000 in 1906, which was the culminating year of the big export movement when China was taking unusually large quantities of American cotton goods upon the re-opening of her markets at the close of the Russo-Japanese war.

Up to the present the cotton manufacturing industry of the United States has been chiefly occupied in meeting the requirements of the home market. Thus while the production of cotton manufactures rose from $268,000,000 in 1890 to $628,400,000 in 1910, the last census year, exports of that class increased from $10,000,000 to $33,400,000. Imported cotton goods, however, did not fully participate in the increased consumption, since they only rose from $29,900,000 in 1890 to $66,500,000 in 1910, with a subsequent decline to about $50,000,000 in the current year.

The following table illustrates the progress of the cotton manufacturing industry of the United States in foreign trade:

(In millions of dollars.)

Fiscal Years.	Exports	Imports	Import Balance.	Export Balance.
1890	.....10.0	29.9	19.9	....
1900	.....24.0	41.3	17.3	....
1910	.....33.4	66.5	33.1	....
1915 (10 mos)	57.9	40.2	....	17.7

This change in the balance sheet is the direct result of the war, which has caused an increase in exports along certain lines and a decrease in imports over a much wider field of endeavor. Manufacturers should remember, however, that no matter how much export business may grow because of the war, that at its conclusion, the European countries, burdened with war taxes, and with hunger and want gnawing at their vitals, are sure to become exceedingly poor customers; at the same time becoming unusually active competitors for the balance of the world's trade.

Improved machinery and efficient management, coupled with an established trade with the now neutral countries, will allow us to retain this business and perhaps increase its volume.

This is a subject for careful study, complete cooperation, and early action on the part of the governing officials of manufacturers' associations.

It is also worthy of your individual attention right now.

Consider!

Act!

A DEPARTMENT FOR DEVELOPMENT WORK.

In the Dyeing, Bleaching and Finishing Department of this issue is an interesting suggestion by a prominent consulting chemist and textile expert that seems worthy of much serious thought on the part of cotton manufacturers as well as cotton growers. His plea for a Development Department to be connected with the cotton manufacturers' associations, with the definite idea of increasing the uses for cotton from a textile standpoint, will be thoroughly appreciated by all interested in the cotton industry when it is remembered that approximately 60 per cent of the American crop is shipped out of the country in the raw state.

Much of this raw material is returned to this country in the form of some kind of finished product and at a greatly advanced price over that of the raw material which went out. Furthermore, as indicated by this writer, the great quantities of silk imported into this country indicates that there are a number of fields which may be utilized to advantage by cotton and which will tend to keep at home and distribute among American workmen hundreds of thoustands of dollars that now go abroad.

Cotton has consistently urged the various "Wear More Cotton" and "Use More Cotton" movements and still believes that American homes should be equipped with cotton damask for the table and other cotton fabrics wherever applicable throughout the home. The use of cotton for men's wear, both summer and winter, should also be consistently urged by every one connected with the industry.

If cotton manufacturers and others interested are actually desirous of increasing the amount of finished cotton products consumed in the United States they should not only consistently support the two movements mentioned, but should also consider seriously Dr. Dannerth's suggestions in connection with a development department for cotton manufacturers' associations whereby new uses for cotton would be developed and promoted to the immense advantage of not only the South, but the entire country.

Comments and suggestions along this line are solicited as a further aid to the all absorbing question "How can the South derive more money value from its principal crop —cotton?"

The Supreme Court of Minnesota held, in the case of Greenhut Cloak Company vs. Oreck et al., that an order for the manufacture of certain goods for delivery in the future was not within the statute of frauds and void because not in writing; that upon acceptance by the manufacturer such an order became a contract between the parties for a breach whereof by the buyers of the goods the seller might retain the goods and recover as damages the difference between the market value and the contract price as of the date delivery was required to be made by the contract, and that the seller in such a case might in good faith and with reasonable diligence sell the goods, the price received on such sale being evidence of their market value.—Bradstreet's.

Most of the cotton grown in Argentina comes from the Chaco. While large tracts of the northern and northwestern part of the country are well suited for cotton, the crop is making little progress. Cotton growers have generally little or no experience and lack capital. The districts where cotton is grown are thinly settled.

They Work and Win.

The Textile Industrial Institute at Spartanburg, S. C., is an unique enterprise in educational work, having as its purpose the social, religious, moral, and industrial uplift of southern cotton mill operatives. The distinguishing feature of this work is a system of half time alternation between class room work and actual work in a mill. It is not so much a trade school as a cultural school with a trade feature. Young men and women over fourteen are given the opportunity of laboring one week in a cotton mill to earn money with which to defray school expenses the next week. The students are drawn from South Carolina, Georgia, North Carolina and Tennessee. They board in the school building close by the mill all the time, during the week of work as well as during the week of study. All the work about the school building and grounds, such as dairying, gardening, cooking, housecleaning, etc., is done by student labor. There are no hired servants whatever.

Hammond Hall, the First Permanent Building.

More than half the cost of this building was borne by the cotton mills in Spartanburg County. The railroads assisted by transporting material free. Architects presented plans and specifications free of charge. Selling agents granted special prices on material. This building is the left wing of the proposed plant. It will accommodate 80 boarding student-operatives and contains all the necessary rooms for the school work. It has been occupied one year. The campus and farm consist of 100 acres and in about two and one-half miles from the business center of Spartanburg.

Several years ago Mr. Camak became intensely interested in the rising generation of cotton mill operatives, and determined, as a minister of the gospel, to dedicate his life to their service; not that these operatives were the neediest class, but he felt this to be his particular work. He studied the situation at first hand and soon found numbers of capable, ambitious young operatives were hungry to go to school, but were hindered by the fact that they must support themselves. Many, too, were far beyond the childhood age without the educational advancement incident to most children, and would, therefore, find serious embarrassment in attempting the public school course along with young children. Again, these grown young people were eager to learn, and the graded school process would prove entirely too slow for them. He saw also, at that time, the dearth of leadership without which the mill population could not come into its own.

These facts led him to establish the Textile Industrial Institute in Spartanburg, S. C., on September 5th, 1911. He started with one student, a borrowed tenement for a home, and a borrowed capital of $100. The mills in Spartanburg, without exception, were exceedingly kind, and gave valuable assistance from the beginning, and there is no suggestion of a sinister motive in their benefactions. From this meagre beginning, less than four years ago, the Institute has grown rapidly. Today there is a $75,000 property in the suburbs of Spartanburg considerably more than half paid for. The last session saw an enrollment of ninety-eight young men and women averaging twenty-two years of age. The entrance advancement of students has been found to be about the sixth grade. Many, even of the

WHERE THE SCHOOL BEGAN.

This first temporary home of the T. I. I. was a tenement in the Spartan Mill village which was loaned by the mill. Here Mr. Camak opened school on Sept. 5th, 1911, with one student, a married man, 33 years old. On the right may be seen a corner of the church to which Mr. Camak asked to be sent in order to work out his idea about the school.

older ones, must begin in the primary grades, and some have started in the first. "I have taught married men to read and write, and have seen married young women weep from embarrassment on beginning in the first reader," says Mr. Camack.

The Textile Industrial Institute is a school with a purpose and a method. Its purpose is to find, train, Christianize, and place the men and women who are to do the thinking for the southern cotton mill people tomorrow. In the days that are to come the chief southern industry will need among its employees, as well as among its employers, men of sturdy character and clear brains; men who can see both sides of a question, men who cannot be swept off their feet by waves of fanatical argument advanced by false leaders or agitators of demagogic character, and men who above all else, must be men of heart. Obviously one institution cannot create the leadership for the whole south, but it can set the pace; it can establish the ideals; and it is doing much of the actual work.

The morally fit young men and women of the mills are found by the system of alternate work and study. None but the most determined will stand the acid test of enforced

REV. D. E. CAMAK.

manual labor required of every one enrolled there. A demonstration of this automatic process of selection transpires at the beginning of each session when a number of recruits are added. For two or three weeks there is an exodus of the "feather-legged" sort, and the other eighty per cent are

ANOTHER TEMPORARY SCHOOL BUILDING.

This was the third temporary home of the T. I. I. at the Saxon Mill village. Thirty boarding students spent the winter in these quarters, four to the room, sometimes three to the bed. Night school, literary society meetings, socials, etc., were held in the improvised dining room shown in the center, "Camak Hall."

seen to settle down to a long, hard, hand to hand battle for intellectual, social, moral, religious and industrial ascendency, and most of them win.

CURRICULUM.

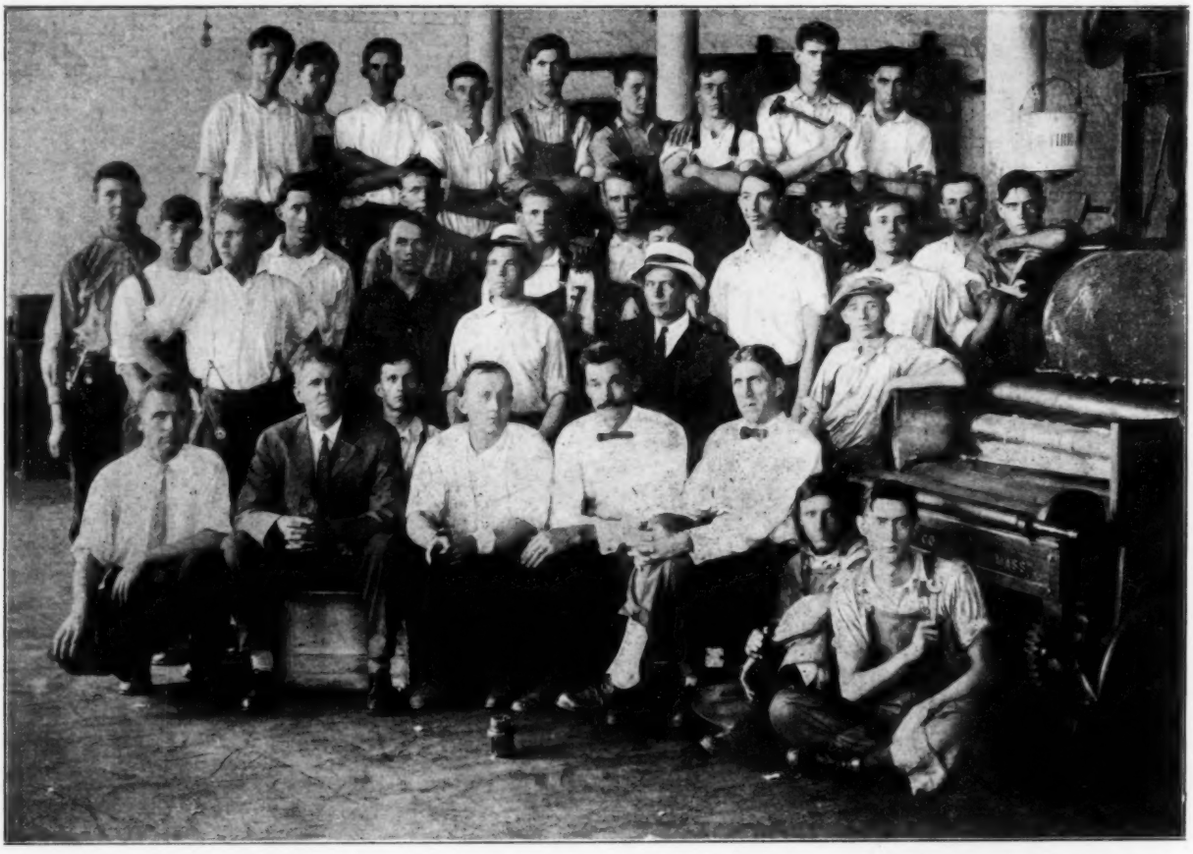
The burden of class room work has to do with the common branches of an English education, since this is the most obvious need. In addition to these common branches the young men have the privilege of a course in textiles and the young women study practical home-making. The textile course is under the general supervision of M. R. Macomson, superintendent of the Saxon Mills, in which most of the student-operatives work. The actual teaching is done by the overseers who lecture in the Institute class rooms weekly and on the morning following take the class for a half day demonstration into the mill itself. Here machines are taken apart, re-assembled and operated. This sort of general course runs through the entire mill from the picker room up. This work on the part of the mill officials is done free of charge. The home-making course, the effect of which is every day more marked in the lives of the young women, consists in practical studies in cooking, sewing, hygeine, sanitation, home nursing, etc. This work is done gratis by Mrs. Camak, the wife of the president.

RELATION BETWEEN SCHOOL AND MILL.

A cordial spirit of cooperation born of a oneness of purpose is the only tie between the school and the Saxon Mills in which its boarders work. The school owns no stock in the mill, nor does the mill have any control over the school. Each corporation is fundamentally independent of the other. The superintendent of the mill is a member of the board of trustees of the Institute. The school, though largely the gift of the cotton mills in Spartanburg county, is the property of the Methodist Episcopal Church, South, which supplies the running expenses.

METHOD OF SUPPORT.

The enterprise is so new and the field of service so wide that it is difficult to procure funds as fast as they are needed to sustain the work. Owing to the fact that each student-operative must have every other week off work to study, it is obviously impossible for him to make enough to buy clothing and pay all the expense of his education. It is therefore incumbent on the school to meet a deficit of about $75 per year on each student. Having no endowment as yet, this fund must be raised through boards of missions, and by private contributions. The world-wide demands on mission boards forestalls the possibility of their meeting all the current expenses, and it is therefore, only through the kindness of wide awake men and women located throughout the mill territory that the work is kept going. The deficit referred to arises from the fact that the student pays only for his board. Five dollars every two weeks is charged for this, and all other school fees are remitted, even including medical attention and book rent.



TEXTILE CLASS OF 1914-15 IN THE SAXON MILLS. SUPERINTENDENT MACOMSON AND HIS ASSISTANTS IN FOREGROUND.

There is, however, so far in the history of the school, no suggestion of anything but permaneney. Hammond Hall, the first permanent building, is of granite throughout and speaks eloquently of the abiding purpose of the management. An expert landscapist has been employed and large plans have been made—plans that appeal to the good sense of practical business men.

The Institute is no plaything. Neither is it an experiment. Four years ago it was an experiment, but the field has been surveyed and the plans tested. Magazines, univer-

sities, schools of pedagogy, great daily papers, in America, Canada and China have hailed the method of work as a practical means of bringing educational opportunity within the reach of thousands hitherto seriously disadvantaged. The Canadian Textile Journal, Montreal, (June number) carried an article written at their request by D. E. Camak, President of the Institute. Editorially this magazine says: "This is a great work. A work that lasts as long as man lasts. The need for such work here (in Canada) is urgent. The illiteracy prevalent in many of the mills is deplorable, and up to the present little is being done to better conditions. Dr. Camak's system worked in Spartanburg. It may not work in Canadian mills, but the basis of the organization he has built up is sound, and the idea of an Institute is thoroughly practical for any district. It should receive earnest consideration from Canadian mill managers."

come. They have in no sense been educated away from their people, but on the contrary have developed a keener sympathy, a broader vision, and a better knowledge of the conditions, through and out of which they themselves have come.

It is a work which deserves the hearty support of all philanthropically inclined persons. It has a great future, and as its work becomes better known, other schools, in other sections, will be established along similar lines. In the years to come these schools and their product, improved men and women, will continue as producing monuments to perpetuate the name of the founder, D. E. Camak, in whose broad vision and humanitarian instincts the idea was conceived and through whose individual efforts this conception became a reality.

A PORTION OF THE PRESENT STUDENT BODY.

All students work every other week and attend classes during the alternate weeks. Eighty percent work in the cotton mill and the other twenty percent on the farm and in the kichen and dining room. Average age of students, 22 years. Average entrance advancement sixth grade. Only young men or women hitherto disadvantaged educationally, or too poor to pay in money for a high school course, are admitted to the school as students.

In a private letter to Mr. Camak, Mr. Bates, the editor, states that he proposes to have the plan discussed by the leading textile men of Canada.

Dr. P. P. Claxton, United States Commissioner of Education, in a statement recently issued by the Department of the Interior states that the plan has some features which may be adopted to advantage by the public schools.

RESULTS.

It is of course too early to estimate the effect of the Institute on the industrial situation. But the fine character, the moral fitness and the unselfish spirit of those who have gone out from the institution leave no doubt as to the out-

Florida sea island cotton has been generally considered the best material for making automobile tires. The fiber is long and fine and makes smooth, strong yarn. But the annual supply of sea island cotton is very limited, being only about 60,000 (equivalent 500-pound) bales, much of which is used for spool sewing thread and fine laces. Egyptian cotton ranks next, and in normal times the crop is 1,500,000 (equivalent 500-pound) bales. This crop, however, will be much reduced by war conditions. The deficiency in these grades must be made up with the longer staples of upland cotton, grown in the Mississippi Valley and often known as "benders" (growing in the bends of the river).

How the Government Renders Assistance To Cotton Goods Exporters.

Many southern cotton manufacturers interested in export trade are making use of the facilities offered them by the Atlanta Branch Office of the Bureau of Foreign & Domestic Commerce and many more would probably be interested in the work of this office were they aware of it.

The Bureau of Foreign & Domestic Commerce was established for the promotion of American commerce and has eight Branch Offices in addition to their headquarters in Washington. The Atlanta office is located at Room 521 Post Office Building and is in charge of Commercial Agent W. A. Graham Clark, a man who has spent most of the last eight years traveling abroad for the Government studying the markets for cotton goods and the manufacturing and distributing methods of our competitors. While able to supply data of value to almost any industry in building up their foreign trade this office pays especial attention to export trade in cotton goods. There are several ways in which the Atlanta Branch Office can be of value to active or prospective manufacturers of cotton goods for export.

THE ATLANTA BRANCH OFFICE OF THE BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

1. The Atlanta Branch Office has for sale, at a nominal sum that only covers cost of printing, numerous pamphlets as to foreign markets. These pamphlets include reports on the Japanese Cotton Industry (showing methods, wages, dividends, construction of cloths, their competition with American goods in Manchuria, etc.); Swiss Embroidery Industry; Lace Industry in England and France, etc.; as well as reports on the market for cotton goods in Canada, Latin-America, Europe, Africa, and Asia, covering this trade in most of the countries of the world. Those pamphlets are in most part written by either W. A. Graham Clark or Ralph M. Odell (who is now in China working up a report on the cotton goods trade of the Far East), but also include reports by other Commercial Agents such as William Whittam on The English Cotton Industry, and by consuls such as the report of Consul-General Anderson on the Cotton Industry in China.

2. The commercial agents and consuls have from time to time sent in numerous samples of cotton goods that they found being sold by our competitors in many countries. Mr. Clark has made clippings from the larger samples and has arranged these in loose-leaf binders, separate binders being used for gray goods, for white goods, for prints, for

dyed goods, for colored goods, for napped goods, for blankets, and for special goods (such as dhooties, sarrias, T-cloths, tanjibs, khangars, and the like). Each sheet in these books has on one side typed data as to where the cloth was made, where sold, cloth particulars, price, etc., while the sample is pinned on the other side. These sample books can be inspected at the Branch Office in Atlanta by anyone interested; or on request of any mill the Office will loan them for a week the sample books containing samples of direct interest to them.

In addition to some 1500 samples already filed in loose-leaf binders as indicated the Bureau has just received a large exhibit from Argentina and is expecting a large batch of samples from Mr. Odell in China. For the coming fiscal year the Bureau has set aside $500 to be expended in the collection of cotton goods samples from South America alone.

This sample work of the Bureau is being perfected and extended and in time Mr. Clark hopes to have a fairly representative line from all of the main markets of the world. Such samples are of much value in showing the widths, weights, constructions, patterns, finishes, etc., that are most populer in the various countries.

In the illustration we show a sample of the data such as is given in the loose-leaf binders referred to. The cloth is not shown but it is simply pinned to the back of the sheet which is 8x10½ inches in size.

3. The Bureau publishes Foreign Trade Directories giving the names of importers of all classes of goods in foreign cities, and consuls send in revised lists from time to time. The Atlanta Branch Office can furnish the names of cotton importers and dealers in almost any city in the world.

4. The Bureau publishes a daily trade paper embodying the latest commercial information from the ends of the earth. This paper is called "Commerce Reports," and the subscription price is $2.50 a year. Each issue carries a page or more of Foreign Trade Opportunities as to articles for which inquiry has been made. Many of these are of interest to the textile trade. They are published in this manner:

No. 16749.—An American consular officer in China reports the name of a firm in his district which desires to communicate with American exporters of cotton yarn. The firm uses single-ply yarn Nos. 24, 28, and 32; also two-ply No. 52.

No. 16732.—An American consular officer in Canada reports that a firm of manufacturers' agents desires to be placed in communication with American manufacturers and exporters of woolen or packing waste and cotton machinery-waste, white and colored. It is stated that the firm desires c. i. f. quotations, and that it purchases in carload lots or less.

No. 16725.—An American consular officer in India reports that a trading company in his district desires to be placed in communication with American manufacturers and exporters of gray and white shirtings, nainsooks, mulls, scarfs, cotton and woolen blankets and rugs, and prints. The company has been selling on a commission basis, but is prepared to buy outright. Samples, prices, etc., should

DEPARTMENT OF COMMERCE
BUREAU OF FOREIGN AND DOMESTIC COMMERCE
WASHINGTON

TEXTILE SAMPLES .

Collected in	Ecuador by W.A.Graham Clark in September 1910.
Cloth made in	Germany.
Particulars	Cotton Trousering, 128/130 centimeters (50.4 to 51.2 inches) wide, 72x60 ends per square inch.
Invoiced	f.o.b.Hamburg, Germany, at 1.10 marks a meter (23.94 cents a yard).
Jobbed	in Guayaquil, Ecuador, at 1.10 sucres a meter (49 cents a yard).
Retailed	in Guayaquil, Ecuador, at 1.25 sucres a vara (66.56 cents a yard).
Tariff duty	(Ecuadorian. Tariff Article No.15). 20 centavos a kilo gross weight. Equivalent to 4.42 cents a pound gross weight.
Remarks	Trade mark of "El Invencible". 30 meters (32.8 yards) to the piece. Cotton trouserings, usually known as "casinetes" are imported into Argentina and the countries of the West Coast in large quantities; they range from cheap checks up to finer goods that are woven and finished to imitate worsteds. They are usually either in full widths of 48 to 52 inches or half widths (splits) of 24 to 26 inches wide. The bulk of these goods are supplied from Germany and Italy, with some from Spain, England, and Belgium.

DATA FROM A LOOSE LEAF BINDER PAGE TO THE OPPOSITE SIDE OF WHICH THE CLOTH SAMPLE IS FASTENED WITH A WIRE CLIP. IN SIZE THESE PAGES MEASURE 8 x 10½ INCHES.

be sent at once. Quotations, in English currency, should be made c. i. f. destination. Correspondence may be in English. Bank references are given.

No. 16604.—A manufacturer's agent in England informs an American consular officer that he would like to correspond with American manufacturers of knit goods, either as agent or buying outright. He is particularly interested in men's cotton half hose, men's fleeced underwear, and ribbed and plain underwear for women. References are given.

No. 16381.—A business man in France informs an American consular officer that he desires to purchase large quantities of cotton tennis flannel in white, cream, and single colors; as well as mixtures and stripes for shirting. The tennis flannel should range in price from 6 to 11 cents a yard. The material for the shirtings should be about 15 to 35 cents a yard. References are given.

No. 16291.—An American consular officer in South Africa transmits the name of a firm which has expressed a desire to receive catalogues and information from American manufacturers of mattress ticking. Correspondence may be in English.

The names of the firms referred to are not published but any American can obtain these by writing to the Atlanta Branch Office and stating the number of the Foreign Trade Opportunity.

5. The Bureau receives many reports that it is not considered advisable to publish but which are embodied in Confidential Circulars and Bulletins and sent to those directly interested in the goods mentioned. For instance on March 10, 1915, the Bureau printed Confidential Bulletin No. 30, a 20 page monograph on the "Cotton Piece-Goods Trade of Manchuria," that is of much interest to mills attempting to meet the competition in that field. Other recent Confidential Circulars deal with "Cotton Prints for Zanzibar," Tent Material for the Chinese Army," "American Yarns Wanted in Brazil," "Hosiery, Underwear, and Neckwear Wanted in Australia," "Hospital Supplies for Madagascar," "Hosiery and Hosiery Yarns for France," "Cotton Goods Wanted in Argentina," etc.

The agent in charge of the Atlanta Branch Office is able to supply not only published literature but information of various kinds of value to those interested in export trade, for instance data as to available shipping routes, the usual time taken in delivery, the usual terms required, the size of the various markets for cotton manufactures and the extent of the competition by other countries, etc. The work of this office is of practical value to the cotton industry of the South and affords an opportunity for close cooperation between the Government and the cotton manufacturers in the extension of our foreign trade in cotton goods.

Nothing on earth can smile but man. Gems may flash reflected light, but what is a diamond-flash compared to an eye-flash and a mirth-flash? Flowers cannot smile; this is a charm that even they cannot claim. It is the prerogative of man; it is the color which love wears, and cheerfulness and joy—these three. It is the light in the windows of the face by which the heart signifies it is at home and waiting. A face that cannot smile is like a bud that cannot blossom, and dries up on the stalk. Laughter is day and sobriety is night, and a smile is the twilight that hovers gently between both—more bewitching than either.—Henry Ward Beecher.

MIDDLE STATES COTTON MANUFACTURERS ASSOCIATION.

The annual meeting of the Middle States Cotton Manufacturers Association was held at Louisville, Ky., on Wednesday, July 21st. The attendance was necessarily limited because of the comparatively small number of mills included in this territory, but much interest was shown by those present in the informal discussions which took the place of set addresses on the program.

The first subject taken up for discussion was that of rules for the purchase of cotton. Methods of handling cotton containing excessive moisture and damaged material were discussed, and also plans for recording tare weights.

Regarding tare, it was stated that a number of cotton concerns now make a guarantee that the tare will not be over 20 pounds, and this arrangement is proving more satisfactory than the percentage plan. However, this guarantee does not eliminate claims for adjustments, as the actual tare weights run up to 22 and 24 pounds, especially from the Memphis district. President Marrs believes that uniform tare should be made a matter of law. Placing this question before Congress for action will be discussed before the various national organizations at their next meeting. He favored putting the tare allowance on the 6 per cent basis, which is applied for foreign trade, though it was brought out that in this event the only result would be an addition to the bagging and ties sufficient to account for the increased percentage of weight.

Secretary Lee Rodman reported having sent out a circular to the members on the subject of accident prevention and the posting of dangerous points in the mill, following the annual meeting last year. The plan did not seem to be favored, he said, as some of the members believed that it would create a bad impression regarding accident hazards in textile manufacturing. It was brought out, however, that many safeguards had been adopted in the various mills for accident prevention.

The workmen's compensation law recently enacted by the Indiana Legislature was taken up. Also a report on the work done by a voluntary commission in Kentucky on a proposed compensation law.

Philip S. Tulley, of the Louisville Cotton Mills, discussed the subject of uniform cost accounting which is being approved by some trade organizations and declared that the attitude of Joseph E. Davies of the Federal Trade Commission is a dangerous one for manufacturers. He quoted from a letter of Mr. Davies to President Wilson, written last March, urging uniform systems of accounting as an easy way to establish uniform prices. He took the position that such an attitude on the part of the commission would limit any development toward intelligent competition. He also refused to concede that uniform cost systems would mean uniform prices inasmuch as local conditions in labor, as well as in other items would do much toward preventing such a result.

Methods of determining the depreciation of equipment was another interesting subject discussed. It was stated by one man that by getting data from machinery concerns it was found that the present equipment could be replaced for the amount at which it was now being carried on the books, with depreciation off. In other words, a plant could at the present time start up new with the most modern machinery without expending more than the current valuation of the old machinery. This seemed to indicate that the de-

preciation factor was too low, but in reality was a reflection of the recent extremely low machinery prices.

Child labor misrepresentation by "investigators" and "special agents" was discussed by the justly indignant members.

Another meeting will probably be held in October of this year.

Secretary A. B. Carter, of the Southern Textile Association, was present and outlined the coming Textile Exposition to be held at Greenville, S. C., Nov. 2nd to 6th.

The following officers were re-elected: President, Capt. Paul J. Marrs, Henderson (Ky.) Cotton Mills; vice-president, Philip S. Tuley, Louisville Cotton Mills Co.; secretary and treasurer, Lee Rodman, Indiana Cotton Mills, Cannelton, Ind.; Directors, R. A. Cochran, January & Wood, Maysville, Ky.; E. S. Hobbs, Aurora (Ill.) Cotton Mills; C. A. Young, Bemis Bros., Indianapolis, Ind.; C. N. Brown, Lincoln Cotton Mills, Evansville, Ind.

NORTH CAROLINA A. & M. COLLEGE SECURES A NEW TEXTILE INSTRUCTOR.

The great increase in the number of southern knitting mills in the past few years has caused a demand for men of experience in these lines. This demand is being met by the Textile Department of the North Carolina A. & M. College at Raleigh, in a manner which shows a close and intimate touch with the industry.

HENRY K. DICK.

The new machinery which will be installed this year will consist of knitting machines, looms and combing machines. The combing machines will be Whitin and Nasmith. The addition of combers also indicates the present trend toward high grade work. This Textile Department already has an excellent equipment of machinery for instruction in cotton manufacturing, and the additional machinery installed this year will bring the equipment completely up to date.

Textile Director Nelson also announces the engagement of Henry K. Dick, who has been for the past five years instructor in knitting, carding and spinning at the Lowell Textile School, as instructor in these subjects at the Textile Department of the A. & M. College, Mr. Dick is too well known to COTTON's readers to need an introduction, but a brief sketch of his experience in the kitting industry will be of interest.

His acquaintance with the knitting industry began when he commenced work for A. McDougall & Co., Hosiery Manufacturers, Lanark, Scotland. At this time men's underwear was their principal product, but about that time they began the manufacture of cycling hose, and following soon after came the manufacture of ladies' sweaters, silk scarfs, mufflers and knitted novelties. In the seven years he remained with this firm he occupied various positions in the mill, being for three years in charge of their hose and half hose department. In 1907 he was awarded one of the medals in "Framework Knitting and Hosiery" under the auspices of the City and Guilds of London Institute. In 1909 he came to this country and during that same year he accepted the position with the Lowell Textile School which he has since filled with so much credit to himself and the school. In 1914 he prepared and was in charge of the school's knitting exhibit at the big textile exhibit in Boston.

The Textile Department of the North Carolina school is to be congratulated for its farsightedness in adding this well known authority to its staff of instructors.

HARMONY AMONG OVERSEERS.

BY A. M. OLIVER.

The question of making all departments in a cotton mill harmonize is one which has received much attention in the past and will necessarily receive much more attention from now on. It is a question of vital importance and is being answered in many different ways by superintendents and agents all over the country. No industrial plant can be run to the best advantage if the overseers cannot agree. If one is blaming another for bad work on every available occasion, sooner or later something is going to happen and that happening invariably results in the better overseer obtaining a position with another company.

A good overseer will refuse to work under such conditions. He realizes that he is not perfect but expects his fellow overseers to come to the same realization and expects help when he needs it. I have worked on scientific management in a mill where the soul ambition of each overseer was to "put one over" on the next fellow. I will even go so far as to say that I have been a witness on an occasion when two overseers stayed after working hours to prove that a fellow overseer was wrong in an argument that came up during the day and to report the result to the superintendent. It almost appeared that their shoes would catch on fire before they could find the superintendent in order that they might prove that they were right and that the other overseer was wrong.

Such a condition makes it hard for the superintendent as well as for the overseers, and the sooner it is corrected the better for all concerned.

In my opinion the best method of establishing harmony among overseers is for the superintendent to call a meeting of the overseers of each class of work once a week. This meeting should be held at a stated time, preferably noon hour, say, from 12 M. to 2 P. M. If conditions are right

a lunch can be served. After lunch the overseers can retire to the smoking room and there discuss questions that have come up during the week. For illustration, if the meeting happened to be comprised of dressing room overseers, they can discuss questions relative to the condition in which they are receiving the yarn from the spinning rooms, whether they are receiving much or little poor work, whether the yarn is coming mixed or light, etc. Troubles with the warpers can be discussed, and slasher troubles can be settled. In like manner the overseers of spinning, carding, weaving, bleaching, dyeing, etc., can discuss troubles and difficulties they are experiencing and can arrive at the best method of correcting the troubles. It gives the superintendent a chance to make suggestions and the overseers a chance to criticize. An overseer is afforded an opportunity to express his opinion or to offer a suggestion. Each overseer is privileged to ask another overseer just how he avoids trouble on any particular point.

I have attended and addressed such meetings on various occasions and find that invariably one or more overseers had a question written on paper for discussion. Each overseer feels that he is a friend of every other overseer; each knows his suggestions are given attention; each learns how other overseers overcome troubles on one thing or another. If an order has been issued by the superintendent during the week and one or more of the overseers are not quite sure how to execute it, they have an opportunity to have it explained at these meetings.

I have observed that after these meetings have been running for two or three weeks the overseers look forward to them with delight. They enjoy getting together and they work in harmony. Harmony among overseers is a necessary asset to any mill trying to compete with other mills.

SOME PRINCIPLES IN LUBRICATION.

BY L. B. LOCKHART.

The most important single principle in lubrication is to use the thinnest oil that will maintain the necessary film on the bearings. The thinness of an oil refers to its viscosity or fluidity and not to its gravity. The oil to use in any specific case depends on definite conditions.

Since one of the main objects of lubrication is to prevent wear, an oil film of the required thickness must be maintained with certainty, otherwise the bearings may come together and suffer irreparable damage. When a metal rod is dipped into oil and then removed some of the oil adheres to the rod. This ability of oil to "wet" metal is what enables the moving part of the bearing to feed oil between the bearings. In case the pressure is high and the oil thin, the oil may be squeezed out as fast as it is fed in, therefore the higher the pressure on the bearing the higher must be the viscosity of the oil in order to serve its purpose in keeping the bearings apart. With a fast moving bearing the oil is fed in correspondingly fast, consequently an oil of lower viscosity can be used with fast moving machinery than with slow machinery, other conditions of using being the same.

Another great object in lubrication is to prevent loss of power. Power may be wasted owing to friction between the bearings, and while this condition must always be guarded against it is now the exception and not the rule that this results in any great loss of power. Power is often wasted, however, by using an oil of too high viscosity. When a thick oil is stirred rapidly it becomes heated. This heating, which represents lost power, is due to friction within the oil itself, that is, to the difficulty one oil particle has in moving over another oil particle. The thicker the oil is and the faster it is stirred the more effort is required and the more it heats. In cotton mills the fast moving character of the spindles, and their great number, make it especially important to use an oil of just the right viscosity. There is a case on record of a mill actually choking down by using the wrong oil on the spindles. Many mills waste power continually by using a spindle oil of higher viscosity than necessary.

In this connection it might be well to state that there are now on the market spindle oils of a fluidity which was not thought possible a few years ago without sacrificing other desirable characteristics of the oil, such as a safe flash point.

Special emphasis is placed on viscosity or fluidity as the viscosity of an oil gives an accurate measure of the "body" of the oil and an indication of its fitness for its particular work. But the conditions of use must always be considered. For a cylinder oil the viscosity must be taken at high temperatures since the viscosity decreases rapidly with increase of temperature. Furthermore, with cylinder oils, and especially with high pressure cylinder oils, the bearings may not stay "wet" owing to the displacement of the oil film from the bearings by the steam. Pure petroleum oils may fail to wet hot bearings, therefore cylinder oils often contain small amounts of "fixed" or vegetable oils. The effect of the vegetable oil is to give a better viscosity at the high temperature and to make the oil stick to the bearings in the presence of superheated steam, but it has the disadvantage of being partly decomposed by the heat in the cylinder yielding corrosive products. It is highly desirable, therefore, to have as little vegetable oil as possible in a cylinder oil.

A number of other factors are of importance in selecting lubricants for special cases. The flash point and the character of the stock from which cylinder oils are made are of the first importance as is the freedom of spindle oils from gumming materials. The development of the petroleum industry, and the recent discovery and utilization of new oil fields of varied character, have placed a wide range of valuable material at the disposal of the lubrication engineer and the manufacturer. Petroleum oils, when suitably made and properly selected, are ideal lubricants owing to their low cost and resistance to decomposition.

With the possible exception of cylinder oils and certain semi-greases, the greatest saving to a mill is not usually in getting a cheaper oil so much as in using oils which more nearly suit the special mill conditions, thus saving in the item of power. While power losses may not seem of great importance to a mill using an ample water supply, these losses are of the very highest importance to a mill buying coal or electric power.

*Consulting and Analytical Chemist, Atlanta, Ga.

The Bureau of Foreign and Domestic Commerce is in receipt of a letter from a business firm in Zanzibar which desires to receive quotations and full information relative to cotton prints similar to the samples which may be examined at the bureau's offices in New York city and Boston. Refer to file No. 16838.

THE MERCHANDISING OF SOUTHERN COLORED COTTON GOODS.*

BY T. HOLT HAYWOOD.

The time was—and it is not so many years ago—that a buyer, when purchasing in the primary market, would always ask whether the goods were Southern or Eastern; if they were Southern the price obtainable would immediately shrink from 5 to 10 per cent, and oftentimes more. There was a reason for this in those days, and the buyers then, as now, were expert judges of fabrics, and bought accordingly.

The first colored cotton goods mill was built in the South in 1837, on the Alamance River, Alamance County, North Carolina, by Edwin M. Holt. It consisted of 528 spindles, and a few years later 16 looms were added. They manufactured what was known as Alamance plaids, a cheaply made fabric, weighing about 4.50 yards to the pound, made of 14's warp and 14's filling, and dyed with the cheapest dyestuff that could be obtained. When the goods were washed, even in cold water, the colors ran terribly, and after a few washings the fabric looked more like a brown sheeting than a colored fabric. In those days, however, there was a big demand in the South for goods of this kind, because, although the workmanship was poor and the colors fugitive, still the fabric was of coarse construction and had wonderful wearing qualities, which were needed by the farmers and workmen of the South. And so the Alamance mills succeeded and other colored cotton goods mills sprung up throughout the South, most all of them, at first, making plaids of some description. They got to making the plaids as light as 8.00 yards to the pound, in the 24-inch width, and as heavy as 3.00 yards to the pound in the 27-inch width. There was so much profit in plaids and so much demand for them that mills sprang up like mushrooms. Quality and workmanship were sacrificed to making goods quickly, and here is where the South made its bad reputation which it has taken so many years to live down.

With so many mills making plaids, it began to get hard to sell them, and then the problem of merchandising the colored cotton goods of the South arose. Up to this time the mills sold their plaids by simply writing letters to nearby jobbers, or rather, jobbers wrote the mills, because the demand for the plaids exceeded the supply. But when the supply became larger than the demand each individual mill had to put salesmen on the road to sell its product. I happen to know of one large mill that traveled twelve Southern gentlemen. Each salesman was an expert poker player, in fact was accomplished in all the arts of entertaining his customers. The mills allowed each salesman a quart of whiskey a day to keep his enthusiasm up. If he drank more than a quart of whiskey a day he had to pay for the excess quantity himself. Any one not even familiar with merchandising can see that this kind of selling was very expensive and could not last—it did not. The mills, instead of making large profits as in the old days, began to lose money. Upon investigation they found that it was costing them entirely too much to merchandise their goods, and, as a remedy, the present system was founded; that is, merchandising through a commission house, which is not only the best, but is the most economical method that can be employed.

The commission house today is not only a merchandising, but also a banking institution. Most commission houses sell Southern colored cotton goods on a commission of 5 per cent. This 5 per cent covers all selling expenses, and also guaranteeing of accounts. The mills do not have to worry at all about the credit of their customers, or about the collection of money due them for their merchandise. All of this is looked after and guaranteed by the commission house. Some mills need money for their goods the day they are shipped or as soon thereafter as possible. The commission house also attends to this, by discounting bills at the rate of 6 per cent per annum, and giving the mills money for their goods long before the bills are due. If it were not for this system most of the smaller mills would not be existing today, because only the very rich mills can afford to wait until the maturity of their bills. The majority of Southern colored cotton goods are sold on terms of 2 per cent, 10 days, 60 days extra—commonly expressed 2/10 60X—or on what are known as seasonable terms, which are, for fall goods 2/10 November 1st, and for spring goods 2/10 April 1st. A mill making colored outings, for instance (which are used only in the fall of the year), ships the goods to the jobber during June, July and August; the jobber does not have to pay for these goods until the 10th day of November. So, if it were not for the commission house discounting the bills, the mills would not get their money until November 10th, although they had probably manufactured some of the goods as far back as January, and had bought the cotton as far back as October of the preceding year. I know of one mill that runs twelve hundred looms on outings continuously. This means a production of about one million dollars' worth of outings per year. This mill could not get along at all it if were not for the commission house discounting its bills, and, further than that, advancing on its stock of outings during the off season. This is another great benefit of the commission house to the manufacturer.

In order to manufacture any class of goods at the lowest cost, a mill has to run on it continuously; that is, avoid changing from one fabric to another, which requires different constructions, different yarns, different finishes, etc. Outings, as mentioned, are used only in the fall and winter; so a mill making outings during the off season has to store them in its warehouses and wait for the proper season to arrive for selling them. This ties up enormous quantities of money, and most mills could not afford to do it were it not for the fact that their commission houses advance them, in money, three-fourths of the market value of their stock, and thus enable the mills to keep running and keep their organizations together. I simply mention outings as an example. The same method applies to any seasonable fabric; in fact, the best commission houses will advance money on staple fabrics of all kinds, whether seasonable or not, if desired by the mills. Discounting bills and advancing on stocks belong properly to the banking department of the commission house, as does also the enormous credit system that has to be maintained by the large commission house.

The credit department knows at all times the financial standing and responsibility of every wholesale dry goods dealer in the United States, and of the export markets of the world with which its particular commission house deals.

*Extracts from a paper presented at the Fourteenth Annual Meeting of the Alumni Association of the Philadelphia Textile School. All rights reserved.

This system is so vast and intricate that I will not attempt to go into details, as it would take volumes to do so; but I want to call attention to the expense, and waste there would be if each mill were to maintain its own credit department, which it would have to do if it did not sell through a commission house.

We now come to the sales department of the commission house, which is, after all, of the utmost importance and is where great skill is required. The sales department also includes the designing department and what is known as the mill department. The mill department of the commission house handling Southern colored cotton goods is what is largely responsible for the marvelous development of quality and workmanship of Southern made fabrics. When the Southern mills first went with commission houses, most all of them were making cheap plaids. The textile experts in the mill departments of the commission houses soon saw that new fabrics of higher classes and constructions would have to be produced, as the public was demanding a better quality of cotton goods all the time. They worked accordingly, and the Southern mills cooperated with them, until today the colored fabrics made in Southern mills are not only the equal of those made in any part of the world, but are the superior in a good many instances.

The designing department of the commission house is very important, especially where the mills represented make the finer quality goods, and of a novelty nature, because in such fabrics as these the designs and colorings are the most important features of the fabric. The designing department gets samples of fabrics, showing new colorings and designs, from all parts of the world. These samples are secured not with the idea of copying them, but of keeping in touch with what foreign mills are doing, because we have to compete with them more and more as time goes on. The birthplace of styles and designs, however, is steadily changing from Paris to New York, and "Made-in-America" styles are ever becoming more popular. Most of the authorities are predicting that New York will soon be dictating styles and fashions to the world, and well she should be, because no more capable, practical and artistic set of designers exist in the world than is in New York City today. A great many of these designers got their first training in the textile schools of this country, to which too much credit cannot be given, because the good they are doing for the entire mill industry of the United States is incalculable.

The actual selling organization is, after all, the most important of the commission house, because its object of existing is to sell goods, and if it did not sell goods in large quantities it would not exist, because it would not get any revenue; that is, commissions. The best commission houses have enough traveling salesmen to cover all the towns and cities in the United States where there are jobbers and garment manufacturers of importance. It takes about fifteen first-class salesmen to do this, and most of them are on the road about 75 per cent of the time. Each salesman carries samples representing the fabrics made by all the mills whose products the commission house handles. It is generally arranged by the commission house that its different mills make different fabrics, so they do not conflict; therefore, one salesman in each territory can carry all lines, and do justice to each mill. Think of the enormous expense and waste there would be if each mill, selling its product without a commission house, were to travel fifteen salesmen, which it would have to do if it presented its fabrics to the trade as attractively as they are presented by a commission house. One cotton goods commission house I know travels fifteen men and represents twenty colored cotton mills. If each mill sold its own goods direct, and traveled as many men as the commission house, it would mean that there would be three hundred salesmen on the road, with three hundred expense accounts, and three hundred separate salaries, and their total sales would not be any more than, if as much as, the fifteen salesmen now employed by the commission house I have in mind. In addition, each mill would have to have its own designing department, credit department, mill department, etc. So you can see, without much thought, that the present system of commission house selling (where the total cost to the mills of merchandising their colored goods is only 5 per cent) is the most economical that can be devised, as well as productive of best results.

The type of commission house salesman today is far different from a few years ago. The old-time salesman was generally a good judge of beverages, cigars, etc., (a far better expert on these things than on merchandise), a wonderful teller of stories, and an allround easy-going, jolly, lazy good fellow. The trade didn't demand anything better, and they didn't get it. Competition is very keen, business hours are short and time is precious. A buyer doesn't have either the time or the inclination to take a drink or listen to a lot of jokes before he purchases his goods. He wants a salesman to wait on him that knows his business, one that has mentality and character and one that is thoroughly posted on his requirements and the market in general. The consequence is that this type of salesman has replaced the old, and there is no finer class of men in the United States than the commission house salesman traveling out of New York today. Each one is an expert judge of merchandise, knows his competitors' goods as well as his own, possesses tact, ability and personality, and in selling goods adheres strictly to the facts and the truth. Salesmen of this type demand big salaries, and they get them. They also get results, and, in the end, are the cheapest kind of salesmen that any house can employ.

It is a wonderful thing to sit in one of the large New York commission houses, with its salesmen spread all over the United States like a fan, and see the orders, telegrams and letters come pouring in from their salesmen. There is no way in which the condition of the different sections of the country can be judged as accurately as from these reports of the salesmen. If a certain section of the country is in a bad condition it will not buy goods, no matter how cheap they are; on the other hand, if a particular section is booming it will buy merchandise, even if the price is high.

The Southern mills are now making a great effort to secure export business, and their business in the foreign markets is increasing rapidly. In times past, this business was handled by the commission house in a careless kind of way; but now, with the export sales broadening and becoming more important, each year, the best commission houses have a well-balanced export department, with a competent man at the head and his necessary assistants. Some of the commission houses have direct representatives in foreign countries; others deal through brokers in New York, who have their representatives in foreign countries; still others deal through what are known as export commission houses, who actually buy cotton goods and re-sell them in foreign markets through their own salesmen. Southern col-

ored cotton mills, located, as they are, where the actual cotton is grown, and where, therefore, there is very little, if any, freight charges to pay on cotton, no loss of interest while the cotton is in transit, and with competent labor and mills equipped with the latest and most up-to-date machinery, are able to compete with any manufacturer in the world, and to go into foreign countries on the same basis as competing nations; that is, where the freight from the United States is not higher than from the foreign countries, or where the tariff is not higher on United States goods than on the goods of other nations. The only thing Southern mills have to fear in their competition for export business is the very cheap labor that can be employed in a great many foreign countries. The mills of this country, however, are hoping to overcome this by better and more efficient work from their cotton mill operatives, and by the superiority in their fabrics.

The best commission houses sell to only four classes of trade: Jobbers, garment manufacturers, big mail order houses (such as Sears, Roebuck & Co. and Montgomery Ward & Co.) and export. All of these different classes are absolutely essential in their way:

The wholesale houses, or "jobbers," as they are called, both large and small, are scattered throughout the United States, and furnish an ever-constant source of supply to the retail merchants in their respective territories. These jobbing houses carry complete stocks of merchandise of all kinds, such as rugs from Turkey, woolens from England, china from France, linens from Ireland, toys from Germany, bleached cottons from New England, blankets from Ohio, colored cotton goods from the South, etc. A great deal of talk has been current lately about doing away with the jobbers and the mills selling direct to the retail merchants. This, in the writer's opinion, is not practicable, because, while the retail merchant's aggregate amount of business in all lines is large, still the amount of goods he would use from each individual mill would be small, and the expense of merchandising direct to the retail merchant would be greater than the profit the jobber now gets for handling the goods.

Garment manufacturers have been growing steadily, and the amount of goods they now use is enormous. The demand of the garment manufacturers, or, as they are technically known, the "cutting up trade," is mostly for the wider goods. In colored cotton goods they demand mostly 36-inch width goods. The jobbing trade, on the other hand, generally want narrower goods, such as 26-inch or 27-inch. In olden times it was the custom of the good housewife to buy goods by the yard and make her own dresses and other garments; now, when time is precious and it is not so fashionable for the women of the house to know how to sew, the tendency to buy made-up garments, which, after all, can really be made cheaper by the big garment manufacturers (who, of course, make them by machinery) than they could be produced if made at home by hand. On this account, the business of the jobbing trade is gradually getting smaller on colored cotton piece goods, while, on the other hand, the business of the garment manufacturer is getting larger. Some of these large cutters buy as much as five and six million yards of colored cotton fabric at a time, and there is practically no jobber in the United States who buys this large a quantity of one fabric in a single order.

The development of the mail order branch of the dry goods business has been nothing short of marvelous. Enormous houses, such as Sears, Roebuck & Co., Montgomery Ward & Co., the National Cloak and Suit Co., and a great many others, reach every nook and corner in the United States, and their catalogs and advertisements reach merchants and consumers, that oftentimes no other branch of the dry goods trade does reach. This is one of the most economical ways of merchandising, and the customer that buys from these mail order houses generally gets good value. The mail order house buys direct from the commission house, has no salesmen's expenses or salaries to pay; their only expense is maintaining their home organization and sending out catalogs and advertisements. Some of these houses buy in enormous quantities, and consequently purchase their goods at the lowest market price.

It has been often said that the reason the colored cotton goods mills of the United States have not secured more export business in the past is because they were not willing to meet the ways and fancies of the particular export market to which they desired to ship their goods. In the last few years, however, there has been a great change for the better, and the writer knows personally of a great many colored mills today that run almost entirely on goods for export. Some of the mills make as many as fifteen or twenty different constructions, which require almost as many different finishes and methods of packing, and at least four or five different widths. This, of course, is troublesome, but getting any kind of business is troublesome, and the manufacturers realize that if they meet the desires of the export markets, the export markets are willing to pay a fair price for the goods. On account of this mutual understanding between the export buyers and our domestic manufacturers, the export business in this country is bound to increase, and there is no reason why the United States, after a few years, should not be enjoying a great part of the export business of South America and other countries that have been controlled for so many years by Great Britain and Germany.

In conclusion, I want to say that a great many politicians and critics have made the statement that it costs too much money to merchandise cotton goods in this country. Experts have been employed by Congress to examine into the methods of merchandising cotton goods, and, after making a complete examination and getting familiar with the details, they have reported that the present system is as economical a one as can be employed. If all the consumers of cotton goods in the United States were to take the pride that they should in the mills of this country, and give preference to "Made-in-America" goods, where the value is equal, and in most cases superior, to those imported, our cotton mills would continue to flourish, and it would not be long before the United States would be the textile center of the world, as regards quantity, quality and style.

It is just as easy to go through life looking for the good and beautiful, instead of the ugly; for the noble instead of the ignoble; for the bright and cheerful instead of the dark and gloomy; the hopeful instead of the despairing; to see the bright side instead of the dark side. To set your face always toward the sunlight is just as easy as to see always the shadows, and it makes all the difference in your character between happiness and misery, and in your life, between prosperity and adversity, between success and failure.—Orison.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

We have passed the first year of the greatest war in history, and there is no abatement of hostilities. Business men in this country who thought the war would be over inside of a year were disposed to hold back and make ready for the rush of business with the advent of peace. That feeling has passed, and enterprising manufacturers and others are now at work in earnest to succeed regardless of the war.

The people of the United States are determined to make themselves more independent of other nations. It is estimated that southern cotton planters have reduced about 5,000,000 acres because of the war, and are now trying to produce some of the supplies they have been buying. It is predicted that if this country does not become involved in the war, which seems not at all likely at this time, but continues to make supplies for the warring nations, it will have a mortgage on the rest of the world when hostilities cease in Europe.

In twelve months of war, our exports have exceeded imports by a billion dollars or more. The balance will undoubtedly continue heavily in our favor so long as the war lasts, and doubtless for a considerable time thereafter. And in this fact, many find ground for optimistic forecasts of our business future. One effect of the war has been to reduce our national debt. At the outbreak of the war we owed six billions, net; soon we shall have reduced the figure to five billions. When normal conditions return to Europe, we shall probably still be a debtor nation, but our burden of debt will be light as compared with that of last August. And this appears at first glance a gain to compensate considerable immediate hardships.

This growing financial strength of the United States in consequence of the situation developing from the war, was expressed in an impressive way by T. W. Lamont, a member of the firm of J. P. Morgan & Co., in a recent address before the American Academy of Political and Social Science, in Philadelphia. As an indication of how we are turning from a debtor to a creditor nation, Mr. Lamont cited the fact that it costs England 1½ per cent more than normal to make her remittances to us. It costs France 2½ per cent, Germany over 12 per cent, and Russia nearly 20 per cent. "We are piling up a prodigious export trade balance," he said. "By the end of the Government year it looks as if it would be over $1,000,000,000. Many of our manufacturers and merchants have been doing wonderful business in articles relating to war. So heavy have been these war orders, running into the hundreds of millions of dollars, that now their effect is beginning to spread to general business, which, even if it is still depressed, shows distinct signs of improvement."

On calling on Paul K. McKenney, Manager of the Texas Cotton Mill Company, of McKinney, Texas, for an expression of opinion as to business conditions generally in Texas, he said that he considered conditions in that section very promising indeed. "Texas has just harvested a dandy wheat crop," said he, "and the recent rains seem to assure the biggest corn crop the state has had in the last six or eight years. Cotton is two to three weeks earlier than was the case last year, and is in dandy shape, and to any one riding through the state, it certainly looks as if prosperity were on its way to us."

"Last fall," he continued, "on account of the price of cotton and general conditions, business out here was very dull. We accumulated a big lot of goods, and the same was true of all the other mills in the state. The jobbers, overall manufacturers, etc., did not do anything like the business that they had anticipated doing before the European war started. Tight money, low price of cotton, etc., made collections rather slow, and caused quite a lot of economy among people, and also caused some of the merchants and jobbers to readjust their business and get things in better shape than they had been in for years.

"Beginning about January 1st, business began to get better, and has been improving steadily and rapidly ever since. The overall manufacturers and wholesale dry goods houses tell me that business with them all this spring has been fine, and that they are looking forward to the best fall they have had in years. Some accounts have had to be carried over, but people have not been spending as much money as usual, and merchants have also been more careful about giving credit, and I believe that most of these past due accounts will be cleaned up this fall.

"As regards the mills, I think most of them in this section are doing fairly well, as the rise in the price of cotton and increased demand for cotton goods has helped the mills out considerably, as most of them laid in their supply of cotton last fall, when cotton was much cheaper and goods selling at a much lower price than has been the case since the first of the year.

"It seems to me that the outlook is very good. Texas and the Southwest generally, is an agricultural country, and its prosperity depends almost entirely on crop conditions. It has always been my observation that when cotton is cheap, more cotton goods are used than when cotton is high in price; and when people have been economizing as they have for the last year, they are inclined to buy the cheaper cotton fabrics rather than those of wool or silk, and this helps to stimulate the cotton business."

Mr. McKenney stated that the dyestuff situation is the one thing that is worrying him, personally, more than anything else. "We are fortunate, however," he said, "in having on hand enough dyestuff to keep us going until December, and I hope that by that time, some arrangements will have been made, so that German dyestuffs can be brought into this country, or that the American chemical manufacturers will have completed their plans and made arrangements so that they turn out a good part of the dyestuffs required by the mills."

In concluding he stated that he felt very optimistic over the outlook, and believes that the mills are entering on a period of good times that he hopes will last over several years.

New mills, changes and additions are noted as follows:

A new mill to be known as the Rex Spinning Company is to be built at Gastonia, North Carolina. The mill is to

begin work with 12,000 spindles in operation, and it is planned to increase this later as occasion may demand. The new mill will be under the management of C. M. Dunn, who was formerly connected with the Dunn, Clara and Armstrong Mills, as General Superintendent. Land for the new mill has been bought, and preparations are being made to begin work at once.

On July 5th the Enoree Cotton Mill, of Enoree, S. C., near Spartanburg, was sold at public auction by the Receiver, A. M. Law. Lewis W. Parker, of Greenville, bid in the property for J. I. Westervelt, though it is understood that Mr. Parker is also interested in it, and a statement has been made that the Enoree Mill will be put into operation within the next sixty days. It is very likely that a new company will be organized to operate the mill, and in all probability a considerable sum will be spent in improvements and repairs to the mill before it is started up again. The name of the mill is to be changed to the Melville Cotton Mills. The property brought $200,001, one dollar above the upset price.

The Gray Mfg. Co., of Gastonia, N. C., will erect an addition to their mill, and install about 4,000 additional spindles.

The Harden Mfg. Co., of Worth, N. C., which was recently burned, will rebuild their mill, installing new machinery throughout. They expect to close contracts at an early date.

C. S. Butt, of Wilmington, N. C., is promoting a knitgoods mill for that place.

The Langley Mfg. Co., Langley, S. C., have placed a large order for new machinery, also an order for considerable repairs to their present machinery.

The Russell Mfg. Co., Alexander City, Alabama, have placed an order for new spinning frames. The Marble City Mills, located at Sylacauga, Ala., but owned by the Russell Mfg. Co., are planning to add new spinning and roving.

An order has been placed by the Union-Buffalo Mills, Union, S. C., for additional spinning frames. This mill operates 88,640 spindles at present, on print cloths.

The Monarch Mills, of Union, have also placed an order for new spinning. This mill operates 61,630 spindles, on print cloths.

T. L. Wainwright, of Stonewall, C. L. Gray, J. G. Daly, and J. M. Guthrie, of Meridian, have organized the Mississippi Fibre Co., and will establish a plant to bleach, dye and treat cotton linters, yarn, etc., for surgical purposes.

It is reported that C. W. Johnston and A. B. Saunders, of Charlotte, N. C., will build a 10,000 spindle mill near Charlotte.

Henry Lynch, John McCullough, Abe Martin, M. T. Taylor and S. C. Candler will organize the Holland Mfg. Co., for the establishment of a hosiery mill at Athens, Ga. 25 knitting machines, with accompanyment equipment, have been ordered. It is proposed to increase this to 100 machines later. The enterprise is capitalized at $100,000.

The Millen Mills, at Millen, Georgia, which have been idle since 1912, have been purchased by W. D. McNeill, of Ozark, Alabama, and it is stated that the new owner will put the plant into operation at an early date. The plant contains about 5,000 spindles.

The Mayes Mills, (formerly Mayes Mfg. Co.) Maysworth, N. C., will build an addition for 10,000 new spindles.

The Southern Mfg. Co., Athens, Georgia, have placed an order for 108 new looms. This mill operates 22,000 spindles on canton flannels.

W. P. Leister, of Columbia, S. C., will build a knitting mill, probably installing 12 knitting machines to begin with. Contract has been let for the building.

The Palmetto Mfg. Co., Anderson, S. C., has been organized with $25,000 capital, and will install machinery for manufacturing Turkish towels.

Richmond Hosiery Mills, Rossville, Ga., will build a branch mill, contract for which has been let.

The Cowikee Mills, at Eufaula, Ala., have placed order for a large amount of new machinery. The Avondale Mills, at Birmingham, under the same management, are also placing orders for new machinery.

R. P. Brooks and associates of Forsyth, Georgia, have purchased the Star Cotton Mills of that place, and will add considerable new machinery. This mill is equipped with 3100 spindles to manufacture warp yarns, 4's to 14's.

The Texas Cotton Mills, McKinney, Texas, have placed an order for two dozen additional looms, and several new spinning frames.

The Long Island Cotton Mills, at Long Island, N. C., are increasing their capacity, adding new card room machinery, spinning, twisters and reels.

The Gaudalupe Valley Cotton Mills, Cuero, Texas, are placing orders for new machinery, adding card room machinery and looms.

NEW ENGLAND MILL SITUATION.

By the time this letter is printed it will be pretty well known that some of the largest colored goods mills in New England are to adopt a short time schedule due to the scarcity of dyestuffs Manufacturers foresee a greater scarcity later in the year and they are looking ahead to the problem of supplying work for operatives who rely upon them in the winter months. It is now understood that no concerted action is to be taken by agreement but some of the large plants will begin running short time before September and will continue that policy until the dyestuffs difficulty is overcome or consumers have reached the point where other than fast colors will be accepted.

The gingham markets have not been broad enough for several months to take care of the possible output. This has been manifest from the low prices at which ginghams have been sold in the face of higher costs and color scarcity. The Amoskeag Manufacturing Company unsettled the views of many traders during the month when it offered its 19,000 range shirting chambray at 6¼ cents, which is ¼ cent a yard below the price of a year ago. The goods go largely to the manufacturing trades. An explanation of the lower price in the face of existing conditions is found in the probability that the large works preferred to accept a full business on one cloth, the greater part of which is in one color, rather than to seek business in scattered volume on many varied cloths for which colors would be hard to get. Taken in conjunction with the bleached madras made by the same concern, and the staple ginghams, these shirtings make up the bulk of the cotton goods output of the company and it seemed to be a good business stroke to get a full trade on these lines, leaving others to worry about trade in other things. That some part of the action was also prompted by the desire to forestall growing competition on the standard shirting, is believed in some circles to offer another explanation for the unlooked for price revision.

The effect of the reduction was far reaching in the mat-

ter of prices for dress ginghams for spring. Goods of this class have already been sold subject to an opening price being satisfactory. If this opening price is not named until the Amoskeag makes a move on Utilities and other standard cloths made in its mills, the chances are that an opportunity will be afforded to jobbers and others to move out the stocks of ginghams they now own. At this writing it is not thought that the Amoskeag will make a move on dress gingham prices until September, which will simply be a return to the policy it followed in other years than the last.

Of the plethora of stocks of popular priced dress ginghams in secondary hands there is not as much question now as there was two months ago. The gingham has not been fashionable in the large sense, and the production in recent years has run far ahead of the normal counter demand. If the present plans of curtailment in colored goods mills are followed out, and there should also be a delay in naming of spring prices until September, manufacturers think an effective cure will be applied to a market condition that has restricted profits a great deal.

Printers and dyers are curtailing their operations steadily because of dyestuffs scarcity. Up to the present time the trade has not begun to call freely for goods so that the curtailment is not felt much. Considerable export business on prints is being declined owing to the inability to furnish the colors required. The finishers are busy on work for spring in fine and fancy cottons and novelties of many descriptions, a large part of this work being done now in anticipation of color delays later on when early spring deliveries must be made. As a rule the buyers of goods are not taking the color shortage as seriously as manufacturers and this will most likely remain their attitude until actual counter shortage of certain staple colored goods makes it necessary to adopt substitutes.

The prices on bleached cottons were revised downward in the third week of July to a basis of 6½ cents for Hopes, 7¼ cents for Hills and Lonsdales, and in a similar ratio on a few other well known branded lines used largely in the jobbing trade. Fruit of the Loom 4-4 goods were not changed from 7¾ cents. Wide sheetings were priced on a basis of 23 cents for the fall business. After these price revisions were completed jobbers began ordering more liberally. At the close of the month there seemed to be a much better tone to the buying, although prices were still somewhat irregular. On wide print cloths the market sagged to the low level of 3¾ cents for 12 inch 64 x 60's. Some late contracts were accepted on a price basis of about ⅛ cent higher. Fall River stocks increased about 200,000 pieces during the month to 1,700,000 pieces of all kinds of goods, principally odd styles.

The openings of many lines of fine and fancy cottons for spring in the large markets brought to public attention the wide variety of costly cotton goods which has been made for the new season, stimulated, of course, by the dearth of imports, and the probability that the trade is going to see another year of sheer fine combed yarn goods for fashionable wear. Any detailed description of the new fabrics would entail the use of too much space at this time. Suffice it to say, that some of the importers of longest experience in handling foreign cloths, have confessed their astonishment at the excellence and wide variety of the new goods.

Buyers have been very frank in their commendations of the new lines. The volume of high priced goods exceeds anything before shown from American mills, many of them running well over 32½ cents to 42½ cents at wholesale, a yard. Voiles of all kinds, marquisettes, rice cloths, leno fancies, jacquard fancies, garbardines, piques, grenadines, lace effects in plain and fancy weaves, repps, poplins, oxford and basket weaves, give some suggestions of the wide varieties offered.

There has been a great volume of clipped figured weaves offered in the new sample lines, the figures being in colored yarns fast to bleaching. The range of silks and cotton fabrics runs from the sheerest marquisette to cloths suitable for men's wear or heavy dress goods. Whether there will be a market for all the novelties and fine fabrics offered will depend upon the continuation of the war and our own ability to keep out of it. In the napped goods mills trade continues good. The distribution of many of these cloths was stimulated greatly by the low prices named in the early part of the year and by considerable demand for export. The mills that make the medium wide duck and uniform cloths for khaki dyeing are still busy on export orders.

Generally speaking the mill situation is far from a discouraging one, in the estimation of shrewd New England men, although they admit the many difficulties that beset trade because of the dyestuffs trouble. A great deal more attention has been devoted to securing export business than has appeared in any public way and several mills are now doing an export business with ports unconnected with war operations. It is understood that some New England brands of brown and bleached cottons, once popular in South America, have been reinstated to good advantage, while one or two large commission houses have done a famously good trade in fine fancy cottons and in plain bleached goods. The Pacific mills will shortly begin the production of bleached cottons as a part of its regular operations.

There has been less labor trouble thus far than manufacturers were fearing. At New Bedford the union operatives voted to take a week's vacation during the first week in August. When the matter became better understood in the trade many of the operatives stated that they would work right along, taking their vacations when they were ready for them and in an individual way. This spirit will probably break up the purpose of some labor leaders to force vacation conditions in an unpopular way in both manufacturing and operative circles.

The business of underwear mills for spring has been a disappointment in the volume of orders tendered. Price cutting in the lower grades tended to demoralize buyers and they have not been disposed to operate for future commitments. The spot business has been fair but the fall duplicating has been generally light. There is considerable interest taken in some export business that is developing in a small way with various ports. The hosiery trade, on the other hand, has been making steady gains, and as a rule the mills are comfortably supplied with business. This is particularly true of the mills that make fibre silk goods. One large plant has all the business it can possibly handle this year. Another, famous for its full fashioned goods, has a better trade ahead than any known for years.

The machine shops are beginning to reflect a growing measure of confidence in cotton mill properties. It became known during the month that the Draper Company has 20,000 looms on its books to be made. They are to go to some of the largest and oldest mill organizations in the country to replace common looms in part and to fill up new weave sheds in other instances. The Whitin plant is quite businesslike, having taken some excellent renewal orders on spinning and carding. The American Machine Company

at Pawtucket is quite busy, while the Saco works have taken many new orders within the past three months. On the whole the situation in the mill shops is better than it has been for some time.

As stated, some of the finishing and dye works are working nearly to capacity on orders for spring goods which are to be stocked earlier than usual, as a provision against dye scarcity later on. The bleacheries are getting busier and some of them are finding the export trade of growing interest. While the yarn trade is not altogether good there are several mills making fine specialties that are very well employed while the colored yarn mills are being tendered more business than they can take care of under present conditions.

COTTON COMMENT.

H. AND B. BEER, NEW ORLEANS.

New Orleans, July 20th, 1915.

The weather during the past month was favorable for the progress of the growing crop, the progress of the Allies in the European war was disappointing, and with the near approach of the opening of the new season, the market experienced a sharp decline.

The fear was generally expressed that the South would have great difficulty in marketing the new crop, except at lower prices, owing to the large carry over from last year's big crop, and because of the restrictions which England is imposing on shipments of cotton to neutral countries, in order to prevent the cotton falling into the hands of Germany and Austria.

Practically the same conditions prevailed last year, nevertheless exports this season will total about 8,300,000 bales against about 9,000,000 last season.

Indications are that the world will have consumed more than 13,000,000 bales of American cotton this season, and there is every reason to believe that the world's consumption of American cotton next season will be larger than it was this season.

American mills are running to their full capacity, having consumed nearly 100,000 bales more than last year during the month of June, with the probability of a total of nearly 6,000,000 for the season. In view of the fact that domestic consumption is now about 100,000 bales per month larger than at this time one year ago, it follows, if this increase is maintained during all of next season, which is likely, the United States will need more than 7,000,000 bales for its own use the coming year. This is a very important feature in connection with the future outlook of cotton, especially when it is considered that estimates for the new crop are for a yield of about 12,000,000 bales, ranging from 11,000,000 to 13,000,000.

On July 1st the government estimated the decrease in acreage this year at 15.7 per cent less than last year, or a total acreage of only 31,535,000 acres vs. 37,406,000 last year, or nearly 6,000,000 less than one year ago.

On July 17th, the United States Department of Agriculture issued a statement showing returns from the South reporting sales of fertilizer tags to June 25th to only amount to 2,636,000 tons, compared with 4,431,000 tons last year, a decrease of 59 per cent, and the quality is said to be inferior to that of one year ago.

These features are bullish and are immovable, for whatever the progress of the condition of the plant may be, the loss in acreage and fertilizers is a fixed issue in the making of this year's crop.

So far the condition of the crop is about normal, and the indicated yield, including the estimated loss from the reduction in acreage and fertilizers, is about 11,800,000 bales compared with nearly 17,000,000 last year.

Under the circumstances, and in view of the fact that America will probably need about 1,000,000 bales more than last season, there is no reason why the South should sacrifice its cotton as it did last fall.

Last fall business was almost impossible because of the inability to sell foreign exchange and on account of the Exchanges being closed until the middle of November.

This year the Regional banks are in existence, and it is said they will be in a position to advance $25 per bale on 12,000,000 bales. Shipping will be possible, and storage facilities in the South have been increased to such an extent that it is said that 10,000,000 bales can be cared for.

If the planters will market their cotton slowly, selling only a portion in the early part of the season, and hold the balance in store, the new crop could be marketed to better advantage than last year's crop. We anticipate higher prices for cotton next season.

THE YARN MARKET.

Although the month of July is usually considered a rather dull month from a businss standpoint, and although the yarn market reflected only moderate trading and a tendency toward hand to mouth buying, still it is undoubtedly a fact that mills making fine combed yarns suitable for mercerizing purposes have enough business to keep them going in a comfortable manner and buyers in the market for spot delivery yarns of this character, especially those who desire to purchase direct from the manufacturer, find it somewhat difficult to secure the amount they desire.

The early part of the month was naturally slow from a business standpoint, inasmuch as the week preceding and succeeding a holiday such as the Fourth of July is generally so because of the great number of people who go away for the holiday and do not get back to business until sometime afterwards. However, the Philadelphia market showed a number of fair size sales. Carded knitting yarn prices were reported weak and the combed yarn demand spotted. Mercerized yarns and mercerizing twist held fairly firm during the period and in fact there was something of a scramble over mercerized yarns on cones for quick delivery, and mercerizers were reported as well sold up for some months ahead. Weaving lines remained unchanged with the demand for yarns light.

The middle of the month found these conditions practically unchanged with the exception of a slight brightening of orders as the results of after the holiday business coming in and a very noticeable tightening in mercerized deliveries. Some dealers said they could sell quantities for future delivery at a price, but that the spinners would not accept the offers. The total volume of business was comparatively small in spite of careful work by yarn salesmen in an endeavor to follow up orders and secure fair size commitments.

The dyestuff situation continues to be the bone of contention and while one set of people argue from the angle that the situation is exaggerated, another set claim that exaggerated or not, the mills are closing down or piling up

gray goods and waiting for something to turn up to give them enough dyestuffs to finish their products for the market.

As the month closes, while there is not a very strong demand for carded knitting yarns, many Southern spinners are refusing offers of 15 cents on a basis of 10's. Two-ply combed yarns continue fairly strong especially mercerizing twist and southern spinners seemed to be well supplied with business as they were letting orders pass by rather than make any price concession. The demand for two-ply was light. Sales of 60's two-ply on cones was made at 45 cents; 60's two-ply combed Egyptian 52 cents; 120's two-ply combed Sea Island at $1.20. The demand for mercerized yarns continued fair and 50's two-ply on ones sold at from 52 to 55 cents; 60's two-ply on cones at 60 to 63 cents; 70's two-ply on cones, at 69 to 71 cents; and 80's two-ply on cones at 79 cents. There seems to be practically no improvement in the weaving lines. Staple cotton dress goods were fair and the towel mills were running at about capacity. Tape mills were, in some instances, reported to be in need of orders. Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

8s	14 @14½	10s	14 @14½
14s	14 @14½	16s	14½ @15
20s	15¾ @16	24s	17
26s	17½	30s	20 @20½

Southern Single Warps.

8s	13½ @14	10s	13½ @14
12s	14 @14¼	14s	14½
16s	15 15½	20s	16
24s	17½	26s	17½ @18
30s	20 @21	40s	25 @27
50s	33 @34		

Carpet and Upholstery Yarns in Skeins.

9-4 slack	15 @15½	8-4 slack	15
8¾ hard twist	13		

Southern Two-Ply Skeins.

8s	13½ @14	10s	14 @14½
12s	14½ @15	14s	14½ @15
16s	14½ @15	20s	16 @16¼
24s	17½	26s	18
30s	18¼ @18½	40s	25 @27½

Southern Two-Ply Warps.

8s	14	10s	14 @14½
12s	15	14s	15 @15½
16s	16	20s	16½ @17
24s	17½	26s	18
30s	19	40s	25 @28
50s	32½ @34		

Northern Two-Ply Carded Peeler Skeins.

22s	20 @20½	26s	21 @21½
30s	22 @22½	36s	24 @24½
40s	26 @28	50s	34 @36

Two-Ply Combed Peeler Skeins.

20s	24 @24½	24s	25½ @26½
30s	28 @30	40s	34 @36
50s	38 @41	60s	45 @50
70s	53 @55	80s	61 @63

Southern Frame Spun Yarn on Cones.

8s	14½ @15	10s	15 @15½
12s	15½ @16	14s	15½ @16½
16s	16 @17	18s	16½ @17½
20s	17 @17½	22s	17½ @18
24s	18 @19	26s	18½ @19½
30s	20 @21		

Northern Mule Spun Carded Yarn on Cones.

10s	17 @17½	12s	17½ @18
14s	18 @18½	16s	18½ @19
18s	19 @19½	20s	19½ @20
22s	20½ @21	24s	21½ @22
26s	22 @22½	30s	23 @23½
40s	25½ @26½		

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	22	12s	22½ @23
14s	23 @23½	16s	23½ @24
18s	24 @24½	20s	24½ @25
22s	25 @25½	24s	25½ @26
26s	26½ @27	30s	29 @30
36s	33 @34	40s	35 @36

An American consular officer in England reports that a firm of manufacturers of machinery cloths desires to be put in touch with American manufacturers of cotton ducks and sheetings up to 130 inches wide, similar to and heavier than the samples, which may be examined at the Bureau of Foreign and Domestic Commerce and its branch offices. The firm also wishes to correspond with manufacturers of cotton leno bagging 24 inches wide. Refer to file No. 16330.

THE KNIT GOODS MARKET.

The knit goods market for the past month is showing improvement. Underwear mills and agents are getting considerable satisfaction out of the steady and large business being done for immediate delivery with jobbers. Advance buying, both for the spring of 1916, and the reordering for the coming fall is for the most part slow and irregular, but spot demand is continuing and it is well known that jobbers have kept down stocks this year to an abnormal degree. In the hosiery end, while a number of hosiery buyers from the jobbing trade have already been in the market and operated for next season in various degrees according to the different kinds of merchandise they handle, other buyers still continue coming in and agents state that there are more still to come. A good business has already been booked and many large houses state that their business in these lines is very satisfactory.

The fiber silk hosiery, referred to last month, continued to overshadow all other grades in the volume of business placed and some large mills are reporting that they are practically closed up in this class of hosiery until next April. Fiber silk yarns are higher at the present time and another advance is confronting manufactures of hosiery, beginning with the first of the year. For this reason it is predicted by some that fiber silk hosiery is going to see another advance. Mercerized goods are in a fairly strong position, but children's heavier goods are said to be slow with medium weight women's lines also reported to be somewhat backward.

There is an unusual feeling of optimism in the knitting trade and the fact that business has been spotty and continues in this manner to some extent does not seem to have a depressing influence among the spinners themselves. There are practically no large stocks of knit goods on hand and the purchasing ability of the great consuming public is certainly increasing as more people are finding employment. One underwear manufacturer is reported as saying that under the circumstances he could not see why knitters should not be optimistic and looking forward to a decided improvement in their business within a reasonably short time.

Undoubtedly, by the time the distributors realize that knit goods, underwear and hosiery as now offered are practically at bed rock prices, the time to make and deliver the goods will be so short that many of them will probably have to pay more than is now asked. Manufacturers of heavy weight underwear are operating fairly well considering the season of the year and some of them are running about full capacity. The light weight trade is somewhat spotty and there are some manufacturers who claim that they are not getting any business worth mentioning. However a fair volume of business is being booked and despite the usual amount of grumbling the prospects seem farily good for the future.

In the hosiery end of the business the dyestuff shortage is undoubtedly a large restraining factor among many mills, but it is something that will probably be overcome in the near future either through the securing of suitable dyestuffs or the acknowledgment on the part of the buying public that they are willing to wear white hosiery to a much larger extent than heretofore. This has already become a very noticeable feature particularly through the southern section of the country and it is a feature that will undoubtedly grow upon the wearer after he has once become accustomed to it.

Makers of 136 needle goods for women are reported to be running about at capacity in some cases and slightly under capacity in others, but taken all in all a fair volume of business along these lines is being done. Fine combed yarn goods are reported to be in good demand, but the orders are mostly for an early delivery. There is a good demand for 240 needle women's hosiery, and mercerized goods are in an excellent position. Some knitters are running on cheap lines of women's mercerized hosiery for export and goods of this character sell for about $1.25 to $1.35 a dozen. Hosiery manufacturers claim that practically all lines of hosiery are selling lower than last year at this time, and that distributors are getting the full benefit of the lower prices of yarns while the manufacturer is carrying the full load of increased cost of dyeing.

It is undoubtedly true, however, that many mills are becoming more and more interested in export lines and with the immense business in knit goods annually handled by the South American countries and by Australia, 80 per cent of which has heretofore been handled and furnished by Germany, there is an excellent opportunity for American knit goods manufacturers to introduce their goods and build up a future market where the demand will be large and the returns satisfactory.

COTTON MANUFACTURING.

DETECTING DEFECTIVE FLYERS.

BY WILLIAM SHAW.

Flyers found on up-to-date fly frames are constructed on just one principle, which is to attach the presser rod to the hollow leg of the flyer as snugly as possible and at the same time give the presser rod due freedom to fly outward and respond to the speed of the flyer.

This principle must be maintained at all times, on all flyers, in order to have well-balanced flyers and obtain bobbins of uniform compactness.

Defective flyers will cause stretching of the strand, by the surface speed of the bobbin and front roll. They allow the twist to escape at the termination of the presser finger. They cause the end to snap on bobbin-leading frames. They cause the carriage to vibrate in spots. When not balanced properly, they often rise and fall among other flyers, injuring and breaking them.

They cause running over and under. They cause a hard and soft bobbin. They cause a loss of production besides being the cause of much waste.

As a rule few carders consider the importance of a well repaired and balanced flyer. Few mill men seem to realize that the flyer is a more ingenius contrivance than other parts of the fly frame. It requires an expert to construct a pair of cones to suit the hank roving to be run on a frame. The problem is undoubtedly the most difficult of all those connected with a roving frame. Varying conditions have so potent an influence, that it does not always lend itself to simple mathematical calculation, and the flyer is responsible for most of the varying conditions found.

The object of this article is to point out to the readers of Cotton that defective flyers will destroy all the care and skill required to construct a pair of cones with proper outlines. No man at the helm of a cotton mill would have a defective cone running on any frame, simply because he knows the amount of bad work that would result. Still, we must admit that the flyer is just as important as the cones, for the reason that a defective flyer destroys the true outlines.

In most cotton mills the presser rods are bought by the dozen, and their attachment to the flyer is left to a person who knows little about the functions of a flyer from the beginning to the ending of a set of roving. Flyers in need of repair should be sent to a shop where a specialty is made of such work. I doubt if there is one reader of Cotton who can point out a mill that is equipped to balance flyers. When flyers are sent to a shop they are properly repaired and balanced, and when in such a condition the true outline of the cones can be attained throughout the set.

It is a quite common practice among carders to feel the roving after doffing to ascertain the compactness of the bobbin. If a soft bobbin is discovered, in most cases it is laid to poor stock; if hard, to good stock. Very few, if any, consider defective flyers as a possible cause.

Lack of twist, fluffy cotton and light work, will of course cause a soft bobbin, but so will a defective flyer. What causes only a few soft bobbins in a set of roving? Visit any cotton mill and go to the warping room; stand at the end of a string of warpers and notice how a certain number is always stopped. It is always a certain number of ends that bother the weaver and warper tender.

In a beam warper we have thousands of ends, still it must be admitted that a defective flyer will cause the warper to stop every little while.

Let us now reason together and study what troubles a defective flyer causes, and let us see what a loss it is to any mill that does not give the flyers as much consideration as the cones. I know of a few men in charge of fixing flyers that conceive the idea, that the tighter the presser rod is attached to the hollow leg of the flyer, the more compact the bobbin will be. They reason that the increasing diameter of the bobbin must force the presser finger to change its position.

When the presser rod is not free to swing and respond to the speed of the flyer two evils result: (1) The diameter of the bobbin increases faster at every layer and in a greater proportion than is right for the distance the rack is shifted. (2) Owing to the decreased pressure the strand is not held as firmly at the termination of the presser and a large amount of twist is lost. These are facts, and this subject is important to every manufacturer.

When the cones are correct for a certain hank roving and the flyers free to swing, the tension is then found between the bottom of the hollow leg and the bite of the drawing rolls, that is, of course, if the proper rack gear is on the frame to suit the hank being made. The speed of the frame must also suit the outline of the cones. Under these conditions the presser pad is at all times in contact with the surface of the bobbin, and the amount of

pressure to a certain extent is controlled by the speed of the frame. Therefore, it is evident that when the presser rod is attached too snugly to the flyer, stretching of the roving takes place, besides a loss in twist. Even to this day some carders claim that the twist gains in some cases. One can never find the figured twist in a strand of roving for the reason that the termination of the presser finger does not hold the strand as firmly as the drawing rolls.

From what has been said, the reader should now have a good idea what an amount of bad work and trouble one single defective flyer will cause. Now, how many defective flyers can be found in any average card room? It is safe to say that at least a dozen flyers on one fly frame can be found slightly out of order, which means weak ends in the proceeding processes. Besides stretching the roving when the diameter of the bobbin increases, the end will snap every little while and in most cases such bobbin must be removed from the frame.

This accounts for the bare spindles sometimes seen here and there about the room.

If the pin in the flyer or the slot in the spindle top is worn, a certain amount of stretching takes place every time the frame is started, for the reason that the bobbin leads the flyer at all times and any slight retardation of the flyer will cause a certain amount of stretch.

Did you, reader, ever notice how a certain portion of the carriage will vibrate on a certain frame? One would sometimes think in such a case that the slide arm connecting the slide to the carriage rail was loose, though at the same time being perfectly tight. Nine times out of ten the trouble can be traced to flyers out of balance, and no matter how you change their position, you have the same vibration.

I have seen frames, on which a large number of flyer pins were worn, run over and under. Besides this, the flyer, due to the vibration from a worn pin, will work up to the top of the spindle and fall among other revolving flyers. Frames in this condition are hard to manage. Replacing a new pin in a flyer is very little trouble, and I am sure such conditions would never exist if those in charge of the fly frames knew the benefit to be derived from replacing a worn flyer pin.

That the flyer and its object is little understood and studied by many carders and others in charge of fly frames, is proven by the fact that mills can be found where the speeder tenders are instructed to turn their flyers so that the presser rods on the back row will be on the opposite side of the carriage to that of the presser rods on the front row, or in other words, to so position all the flyers that the presser rods will meet at every revolution of the flyers at a point between the two rows and at the same time. Carders who give the tenders such instructions conceive the idea that by so doing the carriage is better balanced. They lose sight of the fact that every flyer on a speeder has been balanced separately one by one. Therefore, when vibration is considered, each flyer should receive individual attention. This is just the same as arguing that it is necessary to place pulleys on a line shaft in one position so that the shaft will be better balanced, there is no difference.

On all flyers we find a solid and a hollow leg to which the presser rod is attached. Many are led astray with the idea that one leg is made hollow to allow the strand to pass through it, which is, of course, one reason for that particular design of this leg. However, it should be remembered that such a large channel or slot is unnecessary, and the hollow leg and the solid leg had to be adopted in order to enable a rod to be attached to one side of the flyer and at the same time not overbalance the other side. This defination should be carefully considered by every carder who instructs the tenders as to positioning the flyers as already stated, because when the flyers are so arranged the time for piecing a number of ends is almost double, as owing to the presser finger pointing in opposite directions, it is necessary for the speeder tender to change the position of the flyers, after piecing a broken end or two in the row where the flyers are positioned for piecing. In doing this the tender will often bang the shifter on and off so that it can be heard for an alley or two away. As a rule, one will find where tenders are obliged to position one row of flyers opposite to the other, a shortage of help usually exists, simply because the production is lessened, which means a cut in wages.

The pull at the bottom of the flyer is not as great as some would have us believe, because it takes very little foreign matter inside the hollow leg to break the strand. Every person in charge of fly frames should strive to have the pull or tension between the eye of the presser finger and the surface of the bobbin.

Before placing a flyer on a spindle it should be carefully examined. The presser finger should be positioned to the proportion as to the diameter of the bobbin; that is, have a wooden gauge made the same diameter as a full bobbin of roving, place the flyer on the gauge and notice the position of the presser rod. If the presser rod is not at the back side of the hollow leg, the flyer should be placed in a vise and the presser finger bent.

With the flyer on the gauge, notice also the position of the presser finger on the gauge. If the eye of the pad is in contact with the surface of the gauge, the presser finger should be rounded until only the termination of the paddle is in contact with the surface of the bobbin. That this point is important is proven by the following reasoning: If the reader will examine the face of the presser pad, he will notice a small groove for the reception of the strand. Builders of flyers know that very few persons in charge of fly frames understand how the presser finger should be positioned, so in order to overcome this defect, the groove was adopted. However, if the termination of the presser finger only is in contact with the surface of the bobbin, this groove then becomes an agent only in guiding the strand or keeping the strand at a certain point on the eye of the presser pad. When the termination of the presser pad only is in contact with the bobbin it helps to hold the twist in the strand. On the other hand, if the eye of the pad is in contact with the bobbin, the presser finger does not have the same grip on the strand, and this, aided by the groove on the face of the pad, allows a large amount of twist to escape, and besides this the tension is then between the surface of the bobbin and the drawing rolls, a condition that should never exist on fly frames.

With the proper pressure at the termination of the presser pad, and with the presser pad in the proper position, the tension then comes between the pad and the surface of the bobbin, and we have a slack tension which is always desired.

When the eye of the presser pad only is in contact

with the surface of the bobbin the pressure on the surface of the bobbin is not as great, which is owing to the lesser grip on the strand and the diameter of the bobbin increases faster than those where the presser finger is properly positioned.

Now let the reader go and examine all the presser fingers on a frame that is doffing and see what can be found. I know of no better point to be followed on fly frames, and I want to repeat, *watch the position of the presser finger.*

Is it not a fact that many mills in the past have changed their type of flyer without changing the cones?

Is it not also true that many mills have changed the cones without considering the type of flyer?

Is it not a fact that the superintendent will often oblige the carder to speed up the fly frames?

How many carders in such cases are able to point out to the superintendent how different speeds destroy the true outline of the cones? *All three must be considered; the flyer, the cones, and the speed.*

In my mill experience I have been called time and time again by speeder tenders who could do nothing with a certain flyer that had been repaired by either the section or second hand, on account of the presser rod being too closely fitted to the hollow leg of the flyer, which caused the end to continually snap. In such cases I would simply take the flyer and fit the presser rod to give it more freedom, making sure at the same time that the presser pad was properly rounded so that only the termination of the presser pad rested on the surface of the bobin. The only kind of flyer repairing that fixers or second-hands in charge of fly frames should be allowed to do is gauging the distance of either leg of the flyer from the spindle, and also to properly position the presser finger and replace worn pins.

When the presser rod is severed from the flyer, great care should be exercised when replacing on the flyer. However, if the rod is broken, the flyer should then be sent to the repair shop. I believe I could count the mills on one hand that have a flyer gauge.

That this gauge is important, is proven by the fact that on any fly frame that has been in operation a few years, the lower part of the presser rod will be found damaged from the flyers striking together. If the flyers were gauged this trouble would be entirely eliminated.

Many mills at the present time are troubled with shaky flyers and flyers working their way to the top of the spindle, to finally drop among other flyers, sometimes breaking flyers and often bolsters. Even when the flyer pin is in the best of condition this trouble will sometimes happen, which is usually due to neglect.

The average fly frame doffs about three times daily. Assuming this to be so, we find that we doff 3 x 5.5 x 52 = 858 times every year. In most mills at doffing time, only the flyers on the front row are removed, therefore, the spindle tops on the back row are infrequently oiled, and in a course of a few years both the flyer and spindle top become worn.

I have often heard good practical men laugh at the textile school student, but these men should remember, that in a textile school a man gets the theory and the understanding of the functions of a flyer, and I would rather trust a man to fix a flyer who understands the functions of the flyer from the beginning to the ending of a set, than one who does not.

Comparatively few men understand the winding-on problem, and my argument is, that no man can properly fix a flyer who does not understand the winding-on problem. When a man is familiar with the winding-on details, many things will creep up into his mind while fixing a flyer that otherwise would not.

I submit the following suggestions for those who are obliged to repair their own flyers. When a tender hands in a flyer and claims that the end is continually snapping, place the flyer on a spare spindle, then drop the spindle and flyer heavily upon a soft board, so as to form a resting place for the spindle step, then give the spindle a quick turn and it will be found that the presser finger will not hug the spindle as it revolves around it, but instead, will fly outward instead of the presser rod. In such a case the presser finger should be bent so as to give the presser rod a slightly outward position. In turning a spindle if the presser finger flies outward instead of the presser rod, it stands to reason that the presser rod is too far in the rear of the hollow leg and should be made to occupy a slightly more outward position in order to bring it under the influence of the speed of the spindle.

In fixing flyers, remember that if the presser rod is attached to the hollow leg too snugly, then the presser rod is unable to respond to the speed of the flyer, which causes a loss of twist, causes the end to snap because the diameter of the bobbin increases too rapidly, and the tension is changed from between the surface of the bobbin and pad, to between the surface of the bobbin and front roll. On the other hand, if the rod is not attached snugly enough, the rod in most cases will strike other flyers and cause a lot of damage. Therefore, after the correct position of the rod and the presser finger is arrived at, both legs should be straightened and the pin examined.

The pressure at the termination of the presser finger is greater upon an empty bobbin than it is upon a full one. This feature occurs in all types of flyers.

I was at one time employed as a consulting expert, and was sent to a mill in the state of New Hampshire. In the mill in question the intermediate frames were a source of trouble, while the slubbers and fine frames gave the best of satisfaction. The frames were of a narrow gauge and some persons at one time in charge of those frames had bent the hollow legs slightly nearer the spindle. The puzzling part of this problem was that this mill, while using the best of stock, at every doff bobbins of a different diameter could be found. I knew that fluffy cotton or waste in the raw stock would cause the trouble, but I had never been up against such a problem as this before, and if I had not understood the winding-on problem and the theory and functions of the flyer I could never have solved it. It seems that the flyers were in a poor condition before the hollowleg of the flyers had been disturbed. When the hollow leg was made to occupy a position nearer the spindle, this brought the eye of the presser more central on the surface of the bobbin. After a great deal of work and study, I arrived at the conclusion which proved to be a correct one.

On all flyers where the eye of the presser finger was more central on the surface of the bobbin, the pressure was lessened from the beginning of the set, while those where the presser finger was properly positioned and the hollow leg only slightly disturbed, had a firmer grip on the strand besides offering more resistance to the increasing

diameter of the bobbin from the beginning of the set. This made the diameter of the bobbins unequal. In such a case there was no remedy except to test out all the flyers.

Those in charge of fly frames are led astray for the reason that in most all cases the termination of the presser rests on the empty bobbin and they assume that this position is retained throughout the building of the bobbin, but such is not the case, which can be proven by examining the presser finger when the set is full.

DESIGNS FOR FANCY COTTON FABRICS.

BY THOMAS WOODHOUSE AND JAMES IRELAND.

PART TWENTY-THREE.

The two cloths reproduced in Figs. 101 and 102 serve further to illustrate designs in which the diamond pattern plays an important part. In both cases the diamonds have been bisected by twills each one of which converts, as it were, each diamond into two rectangles—the rectangles of

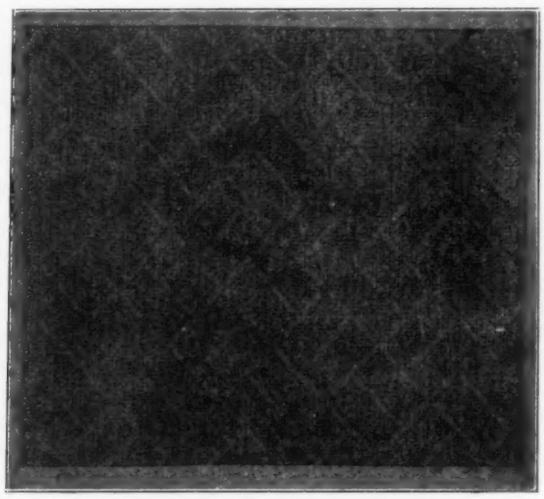


FIG. 101

one diamond being at right angles to those of the other. The cloth in Fig. 101 contains 60 threads per inch of white warp, and 52 picks per inch of blue filling. The design

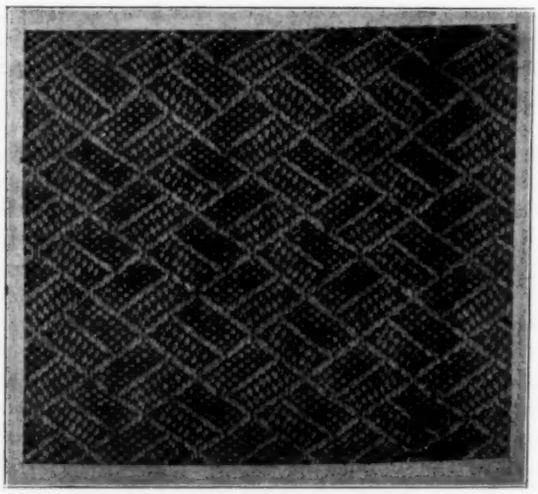


FIG.. 102

for this cloth appears at *D*, Fig. 103, and since no two threads in one repeat weave in exactly the same order, it follows that the draft will be straight over 36 harnesses as shown at *E*, and that the weaving plan will be the same

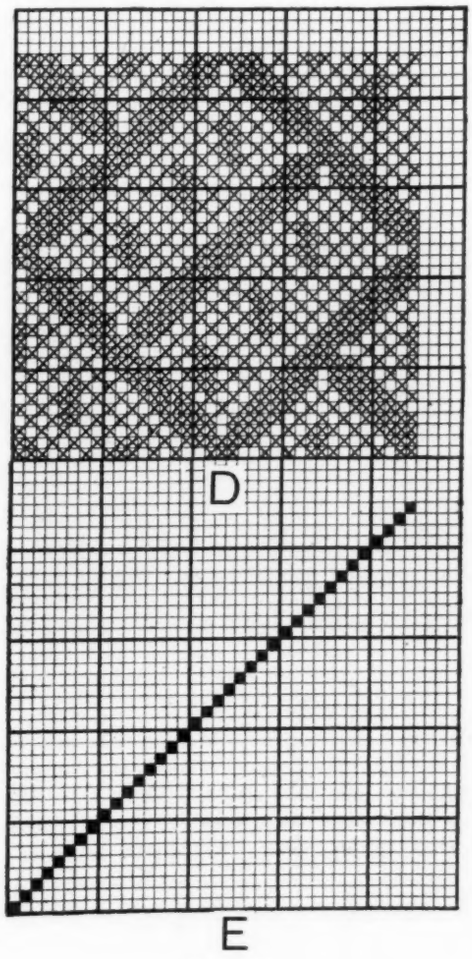


FIG. 103

as the design. The broad twill which forms the outline of the diamond has a 5-thread float, but at the junction of the right and left hand twills, that is at the corners of the diamonds, a mark has been judiciously omitted to prevent the long floats which would otherwise obtain. Similar tactics

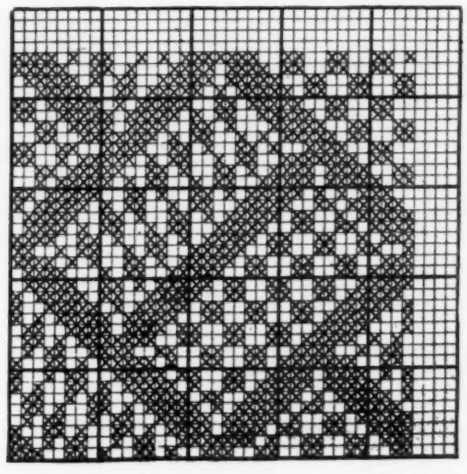


FIG. 104

have been adopted at the extremities of the the two 5-thread twills which divide the diamonds into rectangles. These rectangles are filled with the plain weave, but at three points, as nearly equidistant as possible, two threads have been made to float over five successive picks and to twill in the opposite direction to the three bars which form the long sides of the rectangles.

The cloth in Fig. 102, which contains 56 threads per inch of white warp and 72 picks per inch of black filling, has been made with the same arrangement of diamonds and rectangles, but the latter have been filled-in differently as will be clearly seen from the design in Fig. 104. One rectangle is filled with the 4-thread basket, and the other with the 3/3 twill, the threads of which, however, are arranged in the order 2, 1, 4, 3, 6, 5. The rearrangement of the threads of a straight twill weave in the order given causes each pair of threads to twill in the opposite direction to that of the straight twill from which they are drawn. This pattern would have been better with fewer picks per inch. It will be easily seen that no reduction is possible by drafting, hence the draft is straight on 36 harnesses and the design is also the weaving plan.

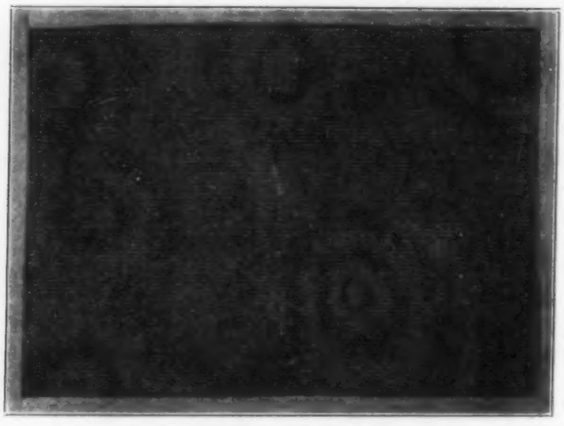


FIG. 105

Fig. 105 illustrates a neat little design on a diamond base. The warp and filling are both of a slate or light blue color, but here again the cloth might be woven in natural colors, and then dyed to desired shades. The complete design for this cloth is shown at *F*, Fig. 106, and it will be noticed that this design might also be constructed by filling in the plain weave on 40 threads and 32 picks, and then filling in between two rows of marks to obtain the 3-foot irregular outline of the diamond. The four diamond figures inside might be constructed in the same way. The irregularity or break in the outline of the diamond, in which each side is made up of three steps, would, in general, be considered a fault, but in this particular instance it rather enhances the value of the pattern than otherwise. The four diamonds and the floating outline show up boldly on the plain ground of the fabric. The draft, as shown at *G*, requires 19 harnesses, and the weaving plan *H* is on 19 harnesses and 32 picks. The cloth contains 64 threads per inch and 44 picks per inch—both warp and filling being 2-fold twisted yarns.

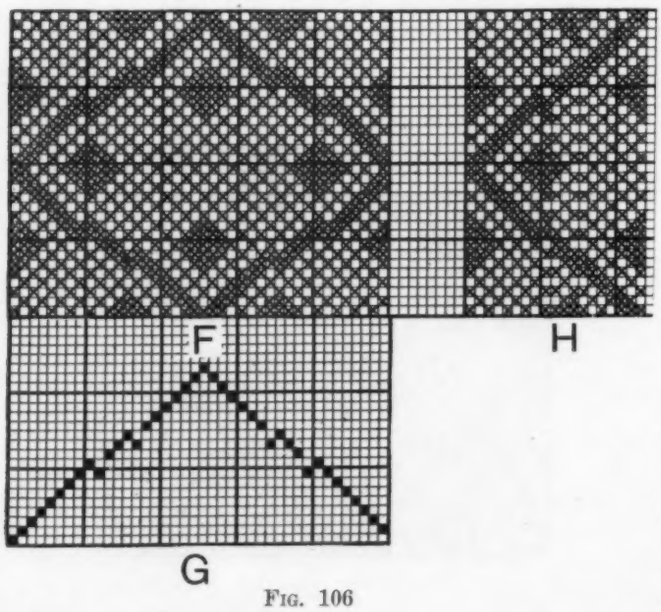


FIG. 106

(To be continued.)

A STUDY OF THE WASTE PILE.

BY H. D. MARTIN.

It is the business of the cotton manufacturers to take the bale of cotton and transform it by a series of processes into marketable goods. Between the bale of raw stock and the finished goods, there is usually a big waste pile which represents a proportionate amount of profit absorption. If the bale has been economically transformed by skillful help and good machinery, the waste pile will be small and assuming everything else to be equally as well proportioned, the profits of the mill will be normal.

The waste pile itself is the evil which attacks the profits most severely and the skillful manufacturer bends his strongest efforts to reduce this waste pile to a minimum. The profit and loss account is, accordingly, the difference between his good management and that of his less skillful competitor. This difference is what spells success for the former and miserable failure for the latter.

Every manufacturer, no matter how skillful, is always ready to admit that more waste is made in any plant than should be and he is always on the everlasting hunt to chase down the leakages. This is a very important item to him as his reputation largely depends upon his ability for economical manufacture. Of course, some waste is purchased with the raw cotton and the manufacturing processes are arranged purposely to sift this waste out and to separate the good material which can be made into the salable articles for which the plant is equipped.

It is the intention in this article to study the various places where excessive waste is made, and to show as far as possible how to prevent excessive waste being made from the time the raw material is bought until it is turned out from the plant as a finished product.

The first shrinkage which occurs is when the cotton is received and reweighed. There may be a loss on account of mistakes in weights at the shipping point; an overdose of moisture, dust and sand, dirt or other foreign matter, leaf, short fibre, excess bagging, buckles and ties. At this point there may also be a loss of stock by sampling, which amounts at times to over one pound per bale, and if the flying bunches of cotton around the yard are not gathered in or looked after, these also enter into the waste

or shrinkage of cotton bought. It is indeed unfortunate that the manufacturer is obliged to start with waste at the very outset, as raw cotton should be sold at net weight.

In the aggregate, there are possibilities for fourteen kinds of shrinkage in the bale of raw cotton before the bale is opened and laid out for the processes in the mill. This is indicated by the darkened portion of the bale marked A in Fig. 2. While these early losses are comparatively small, they all assist in the aggregate. In addition to the items causing waste already outlined, may be added the stock not picked clean from the bagging when the cotton is opened, oily substance in the cotton fiber and stolen stock. The percentage of this class of waste can only be estimated because hardly any two bales or two lots of cotton would carry the same amount of waste material.

Regarding the total percentage of legitimate waste permissable to be made in the mill, this is also an open question. Of course a yarn mill will make less waste than a mill weaving its own yarn. A coarse yarn mill makes more waste than a fine mill. It is the same with a cloth mill. A colored goods mill makes more waste than a white goods mill. A mill manufacturing fancy goods would naturally make more waste than a mill manufacturing plain goods only. Also a mill manufacturing combed yarn goods would bring out still more waste. Taking as an average a yarn mill on medium counts making uncombed work under good management, and it might make as low as 14 per cent waste. The same mill weaving its own yarn on plain white goods might average as low as 16 per cent. While a fancy white or ordinary colored goods mill would increase its percentage to perhaps 19 to 20 per cent.

Assuming that the manufacturer starts with his cotton loaded at 2 per cent of unavoidable waste so far as he is concerned, and which we will say is represented by the darkened end of the bale in Fig. 2, up to line A, then the distance from line A to line B would be the legitimate waste of manufacture as estimated for the different classes of waste for an average mill.

Starting with the picker room, if the beaters, fans and cages are not working right, there will be excessive amounts of good fibre thrown out with seeds, dust, dirt, leaf, sand and very short fibres, and any other possible foreign matter other than that mentioned. In front of the lappers and on carding machines a great deal of lap waste could be avoided. This waste has to be reworked. Reworking lots always makes more waste than if not reworked; as the more the cotton is handled, the more the fibres are injured, shortened and thrown out, thus making additional waste.

At the card we have a still more complicated process with which to contend. Here, if the feed roll, screen, mote knives, coiler, card clothing on top flats, doffer, cylinder and licker-in are not set just right to secure the most advantageous working of the stock, much good stock will again be dropped and many times a good deal of this will be bagged as waste.

The excuse that good stock wasted at the pickers and cards can be reworked should not be accepted,as all reworked stocks increase the contents of the waste bag. This also applies to the drawing frames, as well as to the sliver laps and all subsequent processes up to spinning.

If the steel rolls, gears, nippers, etc., are not polished and in proper order an overdose of reworkable waste will result. All surfaces over which the sliver is dragged should be perfectly smooth and highly polished.

Much needless clearer waste will also be made on these machines as well as on subsequent machinery if the relative humidity is not right. Another cause for excessive clearer waste is when the top rolls are not clean, or are allowed to become sticky with machine oil or with the natural oil from the cotton fibre. Sticky metallic as well as sticky leather covered rolls will gather good stock and deposit it on the clearer, and this will again increase the material going to the waste house. It is doubtful if this particular point has ever been considered by many skilled overseers. Nevertheless this is true and it has probably never been mentioned in print. This particular point, that sticky atmosphere, dirty, sticky rolls pick up excessive fiber which in the end is turned into clearer waste should be remembered. This is why some careful manufacturers are particular to have the right humidity and well cleaned steel and leather covered top rolls throughout

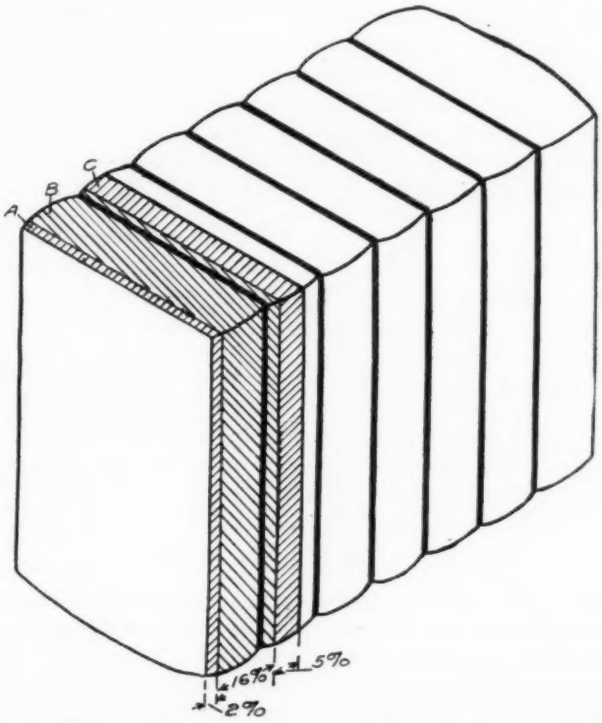


FIG. 2. THE WASTE LOSSES ON A BALE OF RAW COTTON.

their mills. With such manufacturers it is a case of which will predominate, the waste pile or the finished product.

Overfilled cans and improperly filled cans are also a source of reworkable waste. Improperly changing the cans also causes the same evil. In many mills the reworked waste could no doubt be reduced one-half, and all this extra trouble not only causes waste, but also doubles the cost of working, by working the same stock over to produce not quite so good a yarn or fabric as should have been produced in the first place. Reworked stock usually costs more to manufacture as it does not run so well and does not make as good yarn.

Next comes one of the worst sources of waste to be reworked, and that is the creeling of roving and spinning frames. If overseers are not careful to watch this, about two-thirds more roving waste will be made than necessary, and this is very difficult stock to rework, making much tender and uneven yarn. This stock being more or less twisted,

is curly and hard to straighten out. It is a costly process, to rework any of this needless waste material.

Then follows throughout all these various processes, the flying lint which lands on the floor and is carried away with the sweepings. A great deal of this fly waste can be prevented if the twist, the speed and the humidity, together with the adjustment of all machines are right. All through the mill a great deal of waste is made by the operatives dropping good stock on the floor and neglecting to pick it up, leaving it to be trampled upon and soiled. Good stock incidentally made into waste should be placed into boxes or cans assigned for this purpose. It is also important to have all waste cans or boxes properly placarded.

Poorly filled bobbins are another source of waste making. This also includes spools, beams and quills. Warp and filling waste at the looms is a factor, as is also the cloth waste. In some cloth mills needless waste of cloth ends is the result of not having a checking operation on all cloth handled from cloth rolls on the loom to the bale or case in the finishing room. This stock may disappear in a great variety of ways either in or out of the mill. In one fine goods mill in New England this checking up of the goods was neglected for some years. Finally the leaks were found and the reclaimed cloth amount to over one bale of cloth per week. It was used by the operatives

MILL NO..... DATE.....
DEPT NO.....

KIND OF WASTE	PROCESS	TIME GATHERED	NAME OF WASTE MAKER	WHY MADE	POUNDS AND OUNCES	VALUE AS WASTE	VALUE OF PREVENTABLE WASTE	VALUE OF PREVENTABLE IF IT WAS MADE INTO GOODS	NET LOSS	REMARKS

KNITTING DEPARTMENT.

THE MANUFACTURE OF FASHIONED KNIT GOODS.

BY WILLIAM DAVIS, M. A.

PART FIVE.

It is possible by investigating the principles of gauge and from a knowledge of the system of fashioning to draw out a chart of sizes and dimensions for any kind of knitted garment. In outlining the measurements for any particular article, however, it is necessary to ascertain the material out of which the garment is to be made, a very important distinction being that of felting and non-felting materials. It is well known that knitting by machine causes contraction as soon as the yarn leaves the needles of the frame. If the work occupies 24 inches in width measured at the needle ends, it will be found that only a little way down the work, the width has contracted to something like 20 inches. This contraction is common to knitted goods of whatever material they may be made, cotton, wool, silk or flax. The degree of contraction depends to a certain extent on the character of the work, as it is tight or slack; when the stitches are formed from a sparce supply of thread then it is clear that the contraction will be greater than in the case when the thread is supplied in a more liberal manner to the needles.

This behavior is common to most knitted stitches, particularly the plain and ribbed varieties, but in the case of the tuck or double stitch an exception may be found, for it is seen that those clothes go more to width, and in certain cases may give a slightly increased width on leaving the needle ends. The contraction may be accounted for by the fact that in knitting, the yarn is considerably stretched during loop formation owing to the forward pressing movement against the yarn exerted by the sinkers and when the course of loops has been completed, then there is a reaction as the yarn assumes once more its natural disposition. The contraction can also be shown to depend on the nature of the yarns employed. If the thread be of wool and exhibits a slack twist combined with a decided elasticity, then in working between the sinkers, the stretch placed on the thread may give rise to a more or less permanent elongation, and the resulting recoil is not nearly so pronounced. On the other hand for the example of hard twisted cotton yarn, one could not expect the thread to yield its fibre consistency in the knitting strain and any elongation produced would be strictly of a temporary character, the yarn returning to its former length the moment the stretching forces of needles and sinkers were withdrawn.

In drawing out the dimensions for fashioning non-felting materials such as cotton, silk and flax, this contraction has to be allowed for according to the nature of the yarn, the percentage of contraction amounting to anything from 5 to 15 per cent, which figure would require to be carefully taken cognizance of in arriving at the width of the fabric. In determining the sizes, the operator has generally in mind the width and length required in the finished garment, and to those widths and lengths require to be added the contraction percentage before the working dimensions can be handed to the frame worker. For example it may be quite well known that a garment has to lie 19 inches wide when in the finished state on the warehouse table, but the overseer requires much experience before he can tell the frame-worker the width to be set on the frame needles in order to secure this result finished, experience which must be based on a full knowledge of the individual properties of the yarns employed by the manufacturer.

It would seem that the difficulties in this direction are greater when the garments are made from wool than when they are produced from the non-felting materials just referred to. The degree of contraction due to felting is due, as is well known, to the build or structure of the wool fibre itself, which, under the influence of heat, pressure, soap, and alkali is made to contract visibly in length and breadth when in a yarn or garment. The degree of felting due to this cause depends on the method of finishing adopted, the capacity of woolen goods to contract with every subsequent washing presents a formidable objection to the use of wool for the manufacture of knit goods, as they soon become unrecognizable to the wearer. For this reason the treatment whereby such articles are rendered unshrinkable is now almost universally adopted. Even when the unshrinkable process is adopted, however, it is usual to include a certain degree of felting in the finishing operations in order to fill up the interstices between the loops and give the texture greater bulk and consistency. For this purpose many classes of woolen underwear are subjected to scouring and fulling as two distinct and separate operations.

In scouring the primary object is to cleanse the goods from the usual impurities, but even in a light scour an article manufactured from good quality wool will shrink appreciably. In the fulling machine the agents employed are stronger and the vigorous action of the hammers as they descend on the goods brings about effective shrinkage. From a consideration of these points it is easy to understand that the work of an overseer in the knitting department is not easy, especially when woolen yarns are employed in any quantity; and in his efforts to get goods to come into a given length and width, he is frequently almost driven to distraction. Great as the difficulties are they are not unsurmountable and the operator who has mastered the principles of size and measure in regard to the making of full-fashioned underwear garments is a most valuable member of the staff and usually amongst the best salaried workers.

In a recent article in COTTON in connection with this series, the principles of fashioning for all kinds of knit goods were outlined when it was demonstrated that in order to arrive at the scheme of fashioning to be adopted for any garment, it was necessary to know the gauge of the machine and the tightness with which the courses were inserted in the frame. Given these particulars, a number of typical examples were worked out showing how to deal with most of the problems which occur in practice. In these problems, the question of shrinkage was not considered, but it is clear that when garments have to be produced the matter of shrinkage on the needles claims first attention. The importance of this subject is more evident when a finished garment is provided of which an exact reproduction is demanded, a frequently recurring requirement in knitting fac-

tories. There the garment lies complete on the table of a certain width and length and an order has been given for a certain number of dozens of exactly the same weight, gauge, width and length. To reproduce the garment in every particular, requires the correct allowances to be made on the measured dimensions.

GARMENT BUILDING.

When articles such as hose and half-hose are made on the circular knitting machine, the object is to provide the material that it may exactly fit the circular form of the limbs, the fabric being continuous throughout. The same object is sought when articles of larger build are worked on the circular machine of capacious head from which such articles as dressing gowns, etc., can be made by utilizing the large circle of fabric for the body, the sleeves being made on machines of a less diameter and afterwards inserted into the large circular fabric. Now in making full-fashioned goods the method is entirely different. The constituent parts are put together in flat portions and with the seaming assume the required circular form. By making the garments in a series of flat sections, one is able to take exact account of the variations of size and shape and mould a garment which fits perfectly in every particular.

To demonstrate this let us take a ladies' garment as an example of the principle adopted in building a garment for wear on the upper part of the body. The first flat piece is continuous and proceeds for a length double that of the body, the first half being for the front and the second half for the back, each side being made exactly to correspond with the other. There is of course nothing to prevent the back and the front being made in separate portions with a join at the shoulder, but this does not carry any advantage and incurs greater labor in production. This will be clear by consulting Diagram 1, which gives a view of the garment as it is actually produced on the frame, the rib bottom or top R being made on another machine with ribbed arrangement of needles of a similar gauge. If the machine is of the Cotton's Patent type and a number of garments are made in the width, then for an 8-division frame there would be 8 rib tops placed on one top of another on what is termed the running-on or transferring bar. The running-on is done by an assistant or apprentice, for if the frame worker were to do it, a large proportion of output for the frame would be lost, as it would have to stand idle during the operation.

Running-on is usually done by young girls or boys after they have been for a short time in the knitting factory and the operation requires considerable deftness of fingers and accuracy of vision if the running-on process is to keep pace with the production of the frame. Running-on bars of the same gauge as the frame concerned, that is the points are of exactly the same set as the frame and on their undersides are grooved, so as to fit exactly over the beards of the frame needles which facilitates the transference of the loops of the rib top from the bar points to the needles of the frame. Theoretically the rib top should be made of the exact number of stitches, as there are stitches in the width of plain fabric when transferred, every stitch of the rib top having a stitch of plain fabric worked on to it. In practice however it seldom occurs that the stitches come out exactly to correspond, there being generally a few more or a few less than the exact number required. When this is noticed, the correct width is maintained by placing at regular intervals two stitches on one point if there are too many stitches, and if there are too few, one stitch at given intervals has to be made to cover two points. For good work this can only be utilized to a limited extent and the irregularities must be distributed as evenly as possible over the width or a serious defect is incurred.

Such points are always noticeable in the finished garment and if too frequent they may cause the garment to be rejected by a wearer of exact tastes. If the difference between the stitches of the rib top and the required number on the frame is too great, then the rib worker is at once informed and instructed to make a corresponding increase or reduction on the width. If large orders are being executed, it is usual to determine the exact number after a few trials and thus absolute uniformity is guaranteed throughout the entire lot. When the frame operator has completed one set of garments, the assistant hands to him the rib tops already run onto the points of the transfer bar. These are piled one on top of the other, and are eight in number for an eight-division frame, and these the operator transfers each in its turn to the corresponding division of the machine, a process soon completed, after which the rib top is linked to a hooked bar whence connections are made to the fabric roller ready for working.

The vest is started with the front portion as shown in the sketch of Diagram 1, and the fabric worked at uniform width from A to B, in the case of a normal woman's size this would require to be such as would finish about 19 inches wide. When B is reached, the fashioning tackle is set in work and narrowings two needles at once performed after every six courses to the reduced width as given at C, and about two inches are then worked before the bosom or gore portion is inserted. This part is for the better class of trade, and the most important and various ways in which it is produced have already been fully explained in the July issue of COTTON. The pocket is usually about seven inches long when finished and arranged in approximately the position indicated in the sketch, extending from D to E. This completed, another six inches are produced and then the centre point of the garment is reached at X and on the upper side of this it will be noted that the course of the fabric as worked on the frame is exactly the image of that produced from A to X, the corresponding portions being indicated by the letters E_1, D_1, C_1, B_1, an A_1. It will however be observed that the pocket is absent and on arriving at C_1, the frame requires to be set to widen so as to increase the width as shown.

The shaping on this side requires to be exactly identical to that on the front if seaming has to be accurately performed in finishing, and as the narrowings were performed two needles at once, the widenings on the opposite side ought to follow in the same scale. But there are strong objections to widening two needles at once on account of the opening created in the fabric, and although the shaping is not exactly the same as the front, in place of widening two needles every six courses, one could widen one needle every three courses, which done, the article could be completed as before. Many manufacturers have strong objections to this manner of fashioning, although it enables the worker to produce the bulk of the garment at one operation, and fashioning in "2s" also effects some saving in time.

Another means used is to make the garment body in two sections, the first portions being as sketched from A to X with the bosom portion inserted, and narrowings performed two needles at once. A second rib top is placed on the machine and the back worked exactly the same as the face, omitting the bosom, the two sections being afterwards

seamed together along the shoulder. To obtain the highest quality and the most perfect fashioning, however, it is required to begin the article at the shoulder portion, work the bosom and then by a series of widenings one needle at once, increase the width to the bottom of the body. For the back, the part as at X is run on to the needles, and the back worked exactly as described for the front, omitting the bosom, and widening in precisely the same manner as for the front. By this means the form of the article is sure to be the same on both sides and perfect seaming is possible along with accurate shape. By this method also a seam is avoided at the shoulder owing to the stitches being knitted directly onto those of the face portion.

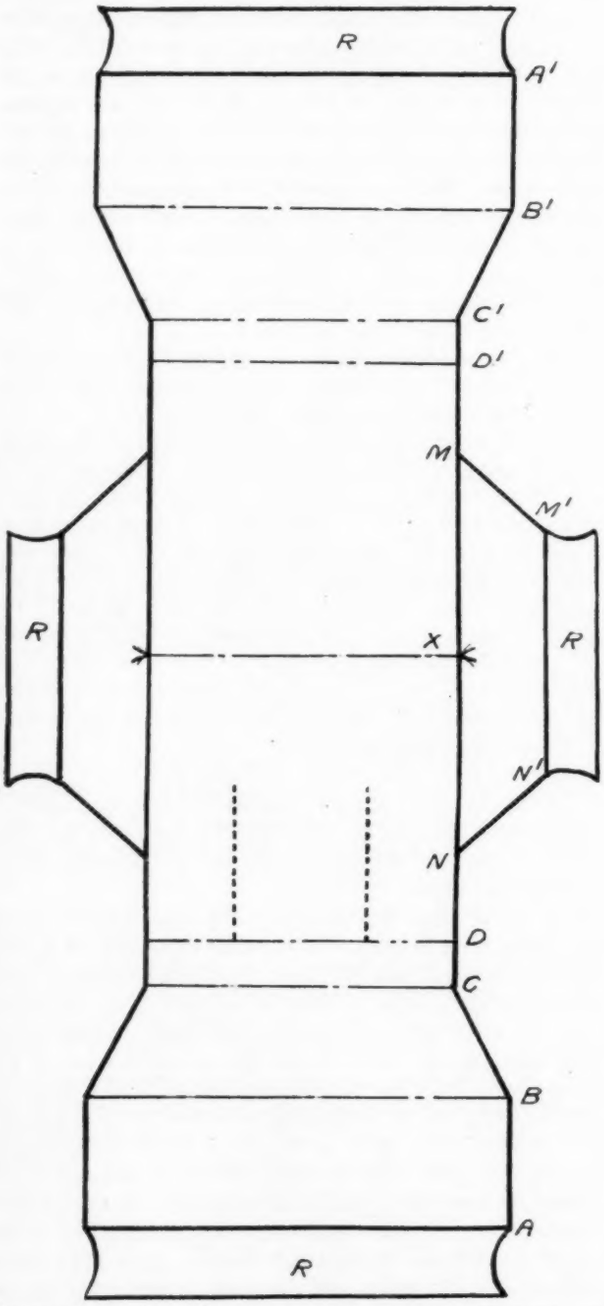


Diagram 1. The Garment as Actually Produced on the Frame.

THE SLEEVES.

The sleeves are next added to the back and front portions as shown in the diagram, the fabric being turned sidewise and about nine inches of the side loops run on to the transferring bar, 4½ inches on each side of the center point X, for short sleeves narrowing is commenced without delay. A common style is to narrow two stitches every four courses until the width has been reduced by about half. The process is repeated for the second sleeve, which is inserted in exactly the same position on the other side of the fabric. The sleeve part is indicated in the diagram by M, N, reduced to the width M_1, N_1 at which point the rib tops R are added.

SEAMING.

The portions as made are next taken to the seamer and binder-off, the latter adding the rib tops which have not been attached on the frame, and the seamer joining the article edge to edge when folded over its centre point X. The means of joining is given on the right hand side, where the part A B is seamed to that of A_1 B_1 on the back, B C seamed to B_1 C_1 on the back, at the sleeve the part M M_1 is joined to part N N_1, and the rib tops seamed edge to edge.

The curved form of the boards used in drying the goods to improve the shape in which form they are also pressed takes away what in the sketch of the garment would seem to be pointed corners, they are all suitably curved and the

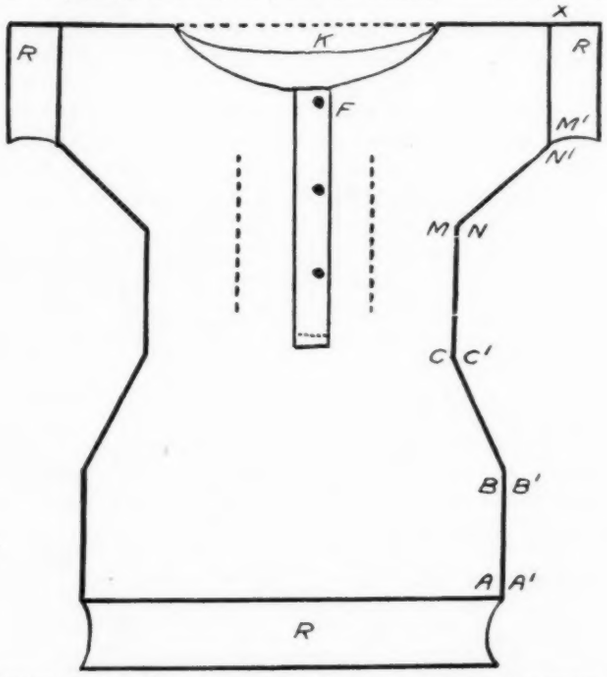


Diagram 2. The Finished Garment After Seaming.

whole moulded into a symmetrical and handsome garment which belongs to the most elegant and useful products of the knitting machine. For a long period after the invention of the power knitting machine, many shrunk from using underwear made from knitted loops on account of the coarseness and discomfort of the seams and the imperfect fitting of the article and it has been the achievement of the trade to alter all this and to give articles which by virtue of their comfort of wear and elegance of style have taken their place among the indispensables of clothing.

TRIMMING.

Diagram 2 also indicates the way in which the garment is finished as regards trimmings, showing the neck K and the front arrangement F. The first operation is the cutting-out of the neck, for although it would be quite easy for the back of the neck to continue in the line of the shoulder as

shown by the dotted section, still it is more general to have the back of the neck somewhat curved inward, as it tends towards neater dressing. The garment is cut as shown by the curved lines and the released part is sewn down to the back of the neck thus affording increased wearing properties at that point.

An opening is also cut for the front P to the length of about twelve inches and the front, usually made of cotton and wool cloth, is provided with button holes, whilst underneath is another corresponding portion furnished with the necessary buttons. The hosiery trimmer has also to take note of the parts where extra strain occurs in the neck, and see that these parts are suitably reinforced. This is done by inserting what are known as the "little bits" at the right and left hand corners of the neck by which means the fabric is prevented from tearing when the garment is being changed.

The garment under discussion is easily produced when it is known how wide to make the cloth on the frame so as to have the article lie the proper dimensions on the warehouse table. As already indicated, if a finished width of 20 inches is desired, then the rib top must contain a number of stitches such as will cover considerably more than 19 inches on the frame, and the exact working width will depend on whether the article is being produced from a felting material such as sheep or goat fibre, or from a non-felting material such as cotton. For example if the yarn be woolen, then we could assume a shrinkage of 15 per cent if the garment required to be fulled, and an extra 10 per cent could be added to allow for the contraction of the width at the needle ends. These allowances together give 25 per cent and to obtain an approximate starting width for this, we should regard the 20 inches finished width as 100—25=75, and the calculation would be stated as follows: If 20 inches width represents 75, what is given by 100. $75 : 100 :: 20 : \times$. $\times = \frac{20 \times 100}{75} = \frac{80}{3} = 26\ \frac{2}{3}$ inches wide on the needles.

In the case of the non-felting material the allowance would not be so great, if this for a particular case were estimated at 10 per cent, then the calculation would be figured thus: If 20 inches represents 90, what width is given by 100? $90 : 100 :: 20 : \times$. $\times = \frac{20 \times 100}{90} = \frac{200}{9} = 22$ 2/9 inches.

If the rib tops were made on a flat rib machine then it would be useful to know the number of stitches to run on to the needles, which could be readily ascertained, knowing the gauge in which the garment had to be worked. Taking the example of the woolen garment is required $26\frac{2}{3}$ inches on the needles, suppose the gauge is 20 Cotton's patent system. This gives $20 \times 2 = 40$ needles on three inches and by proportion the number of stitches on $26\frac{2}{3}$ inches can be obtained. $3 : 26\frac{2}{3} :: 40 : \times$ which gives 356 needles needles (approximately) on the rib top.

For the example of the non-felting material such as cotton, the number would be given by the following: If there are 40 needles on three inches, find the number of needles on 22 2/9 inches. $3 : 22\ 2/9 :: 40 : \times$. $\times = 296$ needles approximately. Comparing the two examples of woolen and cotton garments, the former would require 356 whilst the latter only needs 296, both to produce the same width of finished cloth.

The other calculation required if this article were being produced for the first time, would be the rate of fashionings for the body and sleeve portions respectively. For the body narrowings as indicated by the line B C on diagrams 1 and 2, the diminution in width to be effected by the narrowing points is approximately 3 inches on either side, those narrowings being extended over a length of about 6 inches of fabric.

Given that the fabric is worked "to the gauge" *i. e.*, with 20 courses per inch the calculation would be as follows: To narrow 3 inches of fabric we require to find the number of stitches in that width for a 20 gauge frame. By the system of gauging, 20 G means that there are 20 times $2 = 40$ needles on 3 inches $= 13\frac{1}{3}$ needles per inch. For three inches of narrowings this would give 40 stitches to be narrowed, two at once, which means 20 narrowings on the length of six inches. Six inches of fabric gives 6 times $20 = 120$ courses so that 20 into this number would give the interval as six, that is after working six courses, the frame would fashion by narrowing in two needles. If the fabric were made in the other method mentioned by starting at the narrow width and fashioning up for the lower body one needle at once when the interval would be exactly twice as frequent, namely, widen one needle after every three courses.

For the sleeve we require to narrow from a width of say 20 inches into a width of 12, meaning 4 inches of narrowings at each side, two needles at once.

The 20 gauge has $13\frac{1}{3}$ needles per inch so that a space of four inches gives about 54 stitches or 27 narrowings in all. These would be distributed over a length of about five inches or $5 \times 20 = 100$ courses, so that the interval would be given by $100 \div 20$ or approximately four, that is the frame would be set to narrow two stitches after every four courses until about five inches had been worked. The result of these calculations correspond to what is the case in practical work for a garment of the given gauge and size, and the method shown can be applied with confidence in dealing with any new garment with which the overseer is not already familiar.

A recent issue of the Textile Mercury, published in Manchester, contains an interesting paragraph in the form of an analysis of the counts spun in the Lancashire mills. The journal states:

It is not often that an analysis is made of the variety of counts spun in the cotton-spinning mills of Lancashire. Generally the counts vary from 1's to 350's although in some instances 350's twist or weft is exceeded. In Lancashire and the adjoining areas there are 860 firms engaged in cotton spinning, and of these 264 are manufacturers as well as spinners. By far the greater number of the firms are employed in spinning coarse and medium counts or counts below 60's. Seventy-seven firms spin up to 100's, some of which spin from 100's to 200's; 14 or 15 produce counts from 200's to 300's; and 4 or 5 produce counts of 300's and over. Companies or private firms which go up to 60's and from 60's to 80's and 90's number about 128; the remainder of the 860 firms come below 60's. The figures, of course, give only an approximate idea of the extent to which counts below 60's are produced, for the range in some firms is very wide; companies that turn out 100's and 200's in either weft or twist also spin counts that would come within the limit of medium or coarse yarns.

KNIT GOODS IN THE FAR EAST.

Present indications are that Chinese-made hosiery will supplant almost entirely the supply of such goods which formerly came from Germany and Austria to supply the cheap Chinese trade.

The increased importation of Japanese hosiery in competition with the cheap German goods and the increasing supply of Chinese-made goods have been often referred to. In recent months, however, the Japanese goods have come to be less in favor, for while they made a good appearance and in general are designed to supplant German goods the Chinese user has found them of inferior quality. On the other hand, the hosiery trade in the small hand factories in South China and in the larger establishments started by Chinese capitalists both in Hongkong and vicinity and Shanghai, has been found by Chinese users to be greatly superior to the Japanese in wearing qualities. At the same time these factories have succeeded in turning out goods of very fair appearance. With their usual discrimination in such things, Chinese consumers are turning to the products of their own concerns as representing better value.

The present situation in this trade, therefore, represents a division of trade, on the one hand, between cheap Chinese-made goods with a decreasing import of such cheap goods from Japan and practically no competition in such cheap goods from Europe, and, on the other hand, the import of American and English hosiery for the finer trade. The course of this latter trade of late has been rather in favor of American goods. Whether this shall continue is largely, if not entirely, a matter of quality and price.

The manufacture of Chinese-made hosiery all over China involves the increasing use of Japanese hosiery yarns, largely two-ply No. 32 yarn, especially in the Yangtze Valley and to some extent in Hongkong and south China. Most of the factories and the trade in south China generally continue the use of American yarn, and the south China goods, other things being equal, are said to be preferred by the Chinese consumer, both in the south and in other portions of China. The Chinese-made goods have the advantage of the 5 per cent *ad valorem* import duty on goods imported from Japan, but apparently the superior wearing quality of the Chinese goods generally, and especially those from south China, is the determining factor in the trade at present.

A large share of the hosiery now being made in Hongkong is going to Manila, where the demand for such goods for the use of the Filipinos is increasing very rapidly. The hose now being shipped is of the cheapest quality, though it represents real merit as to wear. The demand in the islands is for hosiery of the brightest colors. A Hongkong factory has recently filled an order for a lot of such goods put up in boxes of a half-dozen pairs to the box, it being specified that each box shall contain a pair, respectively, of green, red, yellow, pink, purple and blue hose.

Not so much underwear is being manufactured in Hongkong at present as formerly. The trade has been obtained largely by Japan. The Japanese goods have the merit of looking atractive as compared with the Chinese-made article and of being very cheap as compared with the European or American made goods. The Japanese underwear is of poor-wearing quality, the garments "drawing" unduly and losing shape almost immediately upon being worn. The Chinese goods of the same grade do not make so good an appearance and cost a little more, but they wear longer and in the long run represent more real value. Both the Chinese and Japanese goods are far below American and European goods in price. The trade in underwear formerly held by Germany is now almost entirely held by Japan.

No attempt was made to distinguish the imports of hosiery into Siam until the fiscal year 1913-14, but the customs entries at Bangkok for that twelvemonth which closed March 31, 1914, show a total import of 9,559 pounds of cotton hosiery, valued at $8,868; 2,776 pounds of silk hosiery, valued at $3,439; and 6,431 pounds of woolen hosiery, valued at $4,520.

These figures represent made-up articles knitted by hand or by machine, but cotton singlets, however, the imports of which for the above period amounted to 75,547 dozen, valued at $113,337, are not included in these figures.

The shares of the leading countries in the cotton hosiery imports for the year under consideration were: United Kingdom and dependencies, 5,986 pounds, value $5,852; Japan, 2,300 pounds, value $1,700; Germany, 1,222 pounds, value $1,271; United States, 7 pounds, value $11; all other countries, 44 pounds, value $34.

Of the silk hosiery the United Kingdom and dependencies furnished $1,371 worth; Japan, $995; Germany, $965; France, $107; Denmark, $1 worth; and United States, nil.

The contribution to the woolen hosiery imports was $3,153 by United Kingdom and dependencies; $462 by Germany, $424 by Japan; $348 by United States; and $133 by all other countries.

The principal demand is for white and black stockings which reach above the knee, and these are required by the Siamese ladies and gentlemen alike, as both sexes wear the national garment, the panung, which reaches to the knees only. For the white and Chinese population the ordinary black and brown socks are needed, openwork and striking colored hosiery being less in demand.

The duty on all classes of hosiery is 3 per cent *ad valorem*. Hosiery is handled by all the leading dry goods firms in Bangkok, a list of which is found in the World Trade Directory.—*Commerce Reports.*

A prominent cotton-goods merchant in one of the insular possessions informs an American consular officer that he desires to deal directly with American manufacturers of cotton piece goods known as "Cabot," similar to the sample, which may be examined at the Bureau of Foreign and Domestic Science and its branch offices. The goods average about 35½ inches wide and about 131.23 feet long. The inquirer states that cash terms can be arranged and that if prices are reasonable he is in a position to handle about 800 bales of this material between July and the end of the present year. Correspondence should be conducted in French. Refer to file No. 16880.

A firm of manufacturers' representatives and commission agents in British Guiana informs an American consular officer that it desires to communicate with manufacturers and exporters of cotton and lisle hosiery; fleece-lined underwear; enameled, black and tan uppers, sheepskin, and sole leather. Prices should be quoted f. o. b. New York. Terms and commission should be stated. Further information may be secured by addressing the Bureau of Foreign and Domestic Commerce and referring to file No. 16984.

Dyeing, Bleaching and Finishing.

INDUSTRIAL CHEMISTRY AND THE COTTON INDUSTRY.

BY FREDERIC DANNERTH, PH. D.

About five years ago, a prominent cotton goods manufacturer, at a meeting of one of the textile associations, called my attention to the fact that the use of cotton as a textile fiber was each year being more and more restricted. He referred to the fact that silk stockings, silk neckties, silk handkerchiefs, and shirtwaists were now being used by persons of very modern means. This together with the fact that our cotton industry has during the past year faced an unusual situation on account of restricted commerce prompts one to inquire if the Cotton Associations of the South have taken any definite steps to check this decline.

The cotton boll weevil continues to be the principal menace to economic production of the fiber. Some idea may be had of the "weevil" situation when it is said that in 1905, it was possible to produce 500 pounds of cotton lint per acre. Then the "weevil" came. In 1915, ten years after the plague had set in, this same acre produced 150 pounds of cotton lint. These figures were submitted to me during a recent visit to one of the principal cotton producers of New Orleans. This same authority stated that the planters in the "Delta Land" have almost stopped raising staple cotton as it takes too long a period to develop and reach maturity, and all through this period it is readily attacked by insect pests of which the worst is the "weevil."

Southern planters tell me that it will be possible to produce 500 to 600 pounds of lint per acre, if this cotton boll weevil is exterminated. The second step which must be taken in the devlopment of the cotton planting industry is to improve the quality of the fiber. It would be unwise to make this statement without at the same time stating that several more or less serious attempts have been made to develop this part of the industry.

The third step would seem to be the increase of cotton acreage, for the amount of land planted in cotton today is, according to J. R. Smith, only one-fifteenth of the total possible area on which cotton could be planted. Today there are about fifty thousand square miles planted in cotton. Such an increase of cotton area as that suggested must be accompanied by diversification of crops, for experience has shown that this is a most important factor. The fourth step then would be to open up new uses for the fiber and in that way stimulate demand.

If no definite steps are taken along the lines indicated we may expect to witness an early decline of our immense cotton planting industry in the southern states. The British government in 1875 began to remove the *Hevea* rubber industry from the banks of the Amazon in Brazil to the plateaus of Ceylon and Malaya. And today the latter districts are producing more than one-half of the world's rubber. In 1895 Egypt produced 222 thousand tons of cotton and in 1910 she produced 455 thousand tons. The production had been doubled in fifteen years. In the year 1910 British India and Egypt produced 1900 thousand tons (1,900,000 tons). These figures being interpreted mean that the cotton planting industry of the United States will be gradually transferred to Egypt and India unless the American cotton planter looks about him.

The crude rubber producers of Ceylon and Malaya soon realized the fact that their method of planting was wrong and that there were a number of insect pests which threatened their crop. Having overcome these obstacles they were in a fair position to produce a bumper crop of rubber in 1914; and they did. They also noted that rubber planting was not worth while unless the rubber could be sold at a fair price, and this meant stimulated demand. One of the results of all these considerations has been the creation of a Development Department by the Rubber Growers Association, and the field covered by that Laboratory in its published reports has convinced every right thinking rubber planter of the wisdom of the course. The investment is yielding dividends.

Considerable money is at present being spent in advertising silk textiles, notwithstanding the fact that this fiber is at present purchased almost entirely from Japan. In the year 1911 we imported from that country over fourteen million pounds of raw silk and five million dollars worth of manufactured silk. The total amount of raw silk imported in that year reached the sum of twenty-seven million pounds, and the imports have not fallen off by any means. If we take into consideration the present attitude of the Japanese Government toward the United States, it becomes clear that international arrangements may put a sudden stop to silk importation from that country. We have recently seen how the European disturbance interfered with imports of rubber from British colonies. In that case American rubber-goods manufacturers pledged themselves to sell no rubber goods or rubber which they previously possessed to enemies of England.

What is needed, more especially in the cotton manufacturing industry, is the development of mechanical and chemical processes which would—

(1) Increase the use of cotton within the United States.

(2) Increase the value of cotton fabrics.

(3) produce new and attractive effects on cotton fabrics.

(4) Help to replace the expensive and less durable fabrics made from foreign grown silk, with the more available and less expensive, home grown cotton fiber.

The replacement of flax, hemp and jute twines by cotton twines has recently been suggested by a large textile manufacturer, and the idea is certainly worthy of notice. In this matter the United States Postoffice Department has set a good example by placing an order for one and one-half million pounds of cotton twine. The entire subject of organized development work is in line with the present tendency to make the industries of the United States self-contained so far as that is rational. We are today selling raw cotton to English spinners and then purchasing from them cotton yarns. In 1910 we imported 180 thousand bales of cotton from Egypt, from which it may be inferred that there is still room for development in our cotton growing states. And this refers to acreage as well as to quality of the fiber.

The manufacturers of artificial silk in Germany have shown us that cotton linters are a valuable raw material for their industry. Large quantities of cotton are used in the

production of pyroxylin and celluloid in the United States, and foreign factories are producing mercerized yarns and fabrics of a very superior grade. All of these valuable products can be made from American grown cotton, but in some cases the industries have remained undeveloped in our land for lack of the necessary technical knowledge. Undoubtedly the greatest progress will be made when systematic development work is taken up actively by the growers of cotton who wish to find a market for their product at a fair price.

As one step in that direction it would probably be necessary to organize an American Cotton Growers' Association. Such an association could then bring to a focus the work which has thus far been done in every phase of the industry whether it pertains to climate, soils, fertilizers, diseases, length and strength of staple, yield per acre, or any other subject of present or future interest to the cotton planters of the United States. Such development work would incidentally serve to bring the cotton growing interests into closer cooperation with the manufacturers of cotton products.

DIRECT COPPERED BLUES.

The importance that merchants have attached to the fastness to washing and light of dyed cotton goods in the last few years, has brought into prominence the various methods of after-treatment for direct colors, as, although there is a fair range of colors which are fast to light without after treatment, as a rule, says A. Edge in the "Journal of the Society of Dyers and Colorists," they possess only a very moderate resistance to soaping. The value of an after-treatment, where the object is to obtain additional fastness to both washing and light, is obviously considerably reduced if the effect is wholly or partially destroyed by the action of soap and soda, as a garment or curtain for which these requirements are necessary will probably have to be washed repeatedly.

A number of experiments were carried out by the writer in order to ascertain the effect of a domestic wash on the fastness to light of after-treated dyeings, a pattern of the original shade being exposed alongside one which had been washed for ten minutes at 130 degrees F. in a solution containing 4 grams. Marseilles soap and 4 grams crystal soda per litre, and afterwards thoroughly rinsed to remove alkali.

The results of these tests show that in most cases the effect of the washing is very slight; the fastness of colors which are suitable for treatment with biehromate and copper sulphate was in some cases slightly impaired, but the result of washing was found to be most marked in the case of direct blues which had been treated with bluestone. The coppering of direct blues is, of course, intended primarily to increase the fastness to light, but a marked improvement in the resistance to neutral soaping is also obtained, and with the exception of a few colors the shade is turned considerably greener. It has been pointed out by M. Fort that the effect of an alkaline soaping on "coppered" blues is to redden the shade, so that it approximates to the tone of the direct dyeing, and also to remove the copper from the fibre. The shade may be partially restored by cold dilute acetic acid, but in almost every case the fastness to light was found to be seriously impaired after washing with soap and soda.

The injurious effect of an olein finish on "coppered" blues is well known, but it was found that this is entirely obviated if dextrin is also present, as a pattern finished with a solution containing 10 parts of dextrin and 5 parts olein per 100 was found to be considerably faster to light than the unfinished shade.

WATERPROOFING TEXTILE FABRICS.

TRANSLATED BY ERNEST STUTZ.

The "Zeitschroft fuer gesammte Textil Industrie" in a recent number describes a new waterproofing process for textile fabrics which offers conspicuous advantages in simplicity and cost of production whilst fully meeting the specifications of the German army which require that the fabric shall support a column of water three inches in height over a surface of 32 square inches for a period of 24 hours without permitting the water to penetrate to the reverse side.

The methods hitherto employed may be roughly divided into three classes:

(1) The fabric is covered with a thin layer of a fatty substance by impregnating it with a non-volatile fat dissolved in a volatile solvent—usually benzine. The solvent is evaporated and the non-volatile fat remains on the fabric. The process is considered expensive by reason of the loss of the benzine and brings with it fire risks.

(2) The fabric is treated with a finishing material not soluble in water. Starch and glue can be rendered insoluble on fabric by various methods, they then have all the characteristics of colloids of resisting water absorption and transmit this quality to the fabric. Gelatine is almost exclusively the basis for such processes and is rendered insoluble on the fibre by the use of suitable basic sesquioxide salts of metals. The result depends upon the degree of concentration of the gelatine and the fabric is liable to be hard to the touch and cannot be improved even by repeated washing operations.

(3) The basis of this class is a colloidal aluminum hydrate deposited on the fibre either as such, or in the form of a basic fatty acid salt. First made by Crum in 1856 and called by him alumina hydrogel it is produced from aluminum diacetate and is an irreversible colloid, which once separated out of solution does not again mix with water. Usually the fabric is impregnated with the alumina salt (acetate of alumina) and, part of the acetic acid escaping during drying, it is rinsed in a soap bath in which basic alumina salt enters into double interchange with fatty acid soda.

The fundamental idea of the new method is based on these last processes and is borrowed from the practice of red mordanting in Turkey red dyeing. The essential constituents of such mordants are clay and oil, the latter of which may be added to the prepared lake. The alumina which is insolubly deposited on the fibre, fixes the oil mordant—usually Turkey red oil or acid castor oil soap—not only as alumina soap but as free fatty acid or neutral fat, which is removed from the fibre by suitable extracting means such as ether or sulphide of carbon. In the new process this method of removing the fatty material from the fibre is made use of to render the fabric waterproof.

The impregnating bath consists of an alumina solution which, when heated, separates out an insoluble basic salt, and a soap, which, in addition to fatty acid alkalis, contains

a number of ingredients characterized by water repellent properties. The soap acts with respect to the alumina exactly like the oil mordant, exchanging soda against alumina with formation of alumina soap. The fatty ingredients in a state of emulsion are separated out and deposited on the fibre. The conditions are similar to those prevailing on unbleached cotton which also contains fatty and waxy ingredients and is therefore moisture resistant.

The special soap preparation combines with dilute alumina solution without producing a flocculent deposit of alumina soap—on the contrary there results an extremely fine emulsion which is absorbed like clear alumina solution by the fibre. The fact that it foams, thereby indicating the presence of a dissolved soap in spite of excess of alumina, proves that it is not a finely divided insoluble alumina soap.

The bath penetrates the fibre thoroughly and in drying the alumina and fatty substances remain fixed.

The operation is completed in one immersion thereby producing greater simplicity and cheapness of production as compared to other methods.

The water is repelled from the walls of the cells and force is required to squeeze it through.

SIR THOMAS WARDLE'S WORK ON NATIVE INDIA DYESTUFFS.

BY S. F. CARTER.

The present lack of artificial dyes and the interest which is consequently shown in the utilization of natural dyestuffs, and the successful application of which calls for the specialized skill and experience which the dyer in the past had to possess in order to develop to the utmost the coloring matters with which nature supplied him, recalls to all the excellence of results obtained by the native workers in the far east, where this ancient art originated and gradually found its way to the west and later civilization.

In connection with the dyeing practiced by the natives in the east, and more especially India, where permanent and artistics colors are produced by primitive means from many dyestuffs which are still practically unknown, the work and investigations of the late Sir Thomas Wardle become of interest to all who are in any way connected with dyeing or textile printing.

This gentleman, owner of a well known and successful silk dye and paint works near Leek, England, and himself a practical colorist and chemist, after a lengthy examination of native dyed fabrics was so struck by the permanence of the work as compared with that produced by the colors then in ordinary commercial use, that he decided to study the original dyestuffs used and see what results could be obtained in applying them by modern and improved methods.

The British Government, whose cooperation he sought, obtained for him a large collection of native dyestuffs which he investigated and was so far successful in the results obtained, that they sent him to India to give personal attention to the subject and furnish them with a report.

The account of his visit to those parts of India where the native industry of dyeing is carried on is very interesting. The dyeing as described being done in small dyehouses, directed by a master dyer under whom four or five men work.

He spoke of visiting a number of these small dyehouses in one native town and having most interesting talks in each one, the dyers in each case leaving their work and going with him to the next dyer whom he visited, until finally he had a large following.

On leaving the last dyehouse all proceeded to a public place where a large circle was formed around him. He then produced samples of the results he had obtained, which were passed round and much surprise expressed at the superior shades which he had got by using their dyestuffs by his own modern methods. After this he was asked a great number of questions, such as only experts in the art could put and finally, one native acting as spokesman, greeted him as the first European whom they had ever met who was master of their craft, and informed him that if he would engage in business in India they would all be honored to work for him.

The results of Sir Thomas Wardles' investigations were published in a government "Blue Book" entitled "The Dyes and Tans of India." He strongly advised the government to encourage the cultivation of these useful and little known dyestuffs and make them articles of commerce. Unfortunately the matter was allowed to languish, otherwise we should, no doubt have had many valuable natural coloring matters on the market today and a very interesting field for experiment and development thrown open. The range of color was wide as may be seen from the fact, that at a lecture given by Sir Thomas, he exhibited a collection of patterns dyed the shades of the various precious stones. Though the subject did not get the support it should have had, he did not give the matter up but introduced a variety of these dyestuffs into practical use in his own works and made a specialty of what he termed "Permanent Work" produced by this means, which was much esteemed and commanded a higher price than the ordinary products.

We hear a great deal of the triumps achieved in the manufacture of artificial dyestuffs and honor the names of the master minds whose patient work and learning have bourne such great fruits, but we should also remember the name of the one man who took up the investigation of what nature still holds in trust for us in a country which represents an ancient civilization.

Cheap hosiery hitherto sold in Brazil to importers has been made principally in Germany. Local mills, using native and imported yarns, manufacture good grades of cotton hose and inferior silk goods. Since the beginning of the war imports of yarns have fallen off and the native mills have had to resort to inferior yarns made locally.

Import duties vary according to quality, size and material. Anything in the nature of embroidery upon hosiery occasions a 30 per cent increase in tariff. Ordinary open work and clocks on the sides are not regarded as embroidery. Stocks in hand have greatly diminished, but the demand is still not urgent. United States manufacturers should be able to enter the market more extensively with the better grades, but cannot easily compete with native mills in cheaper hosiery. Goods should be marked "Made in U. S. A." as the trade takes kindly to foreign goods in wearing apparel.

Brazil importers generally object to payment before seeing the goods. Business can be obtained most readily on a basis of credit of three months or more.—*The Americas.*

Practical Problems Discussed by Cotton's Readers

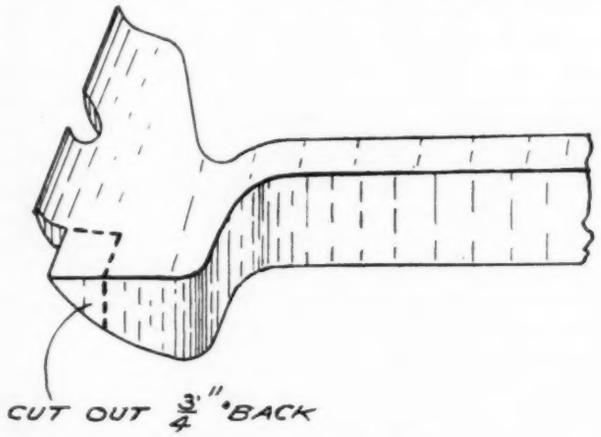
We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.

FEED ROLL CLEARERS.

EDITOR COTTON:

The feed roll clearer roll is a very important factor on a card and one that should be very carefully looked after to see that it *rolls* continually. It is the duty of this clearer roll to collect the short lint and other foreign matter that drifts around and on the licker-in casing, later sliding down the casing to the clearer roll and to the feed roll. If the clearer roll is not in condition to roll continually, such trash, lint and other defective material will follow the feed roll over into the stock in process and from there on into the card.

Trouble with these clearer rolls on cards have been one of the continuous problems in many mills. A method I have adopted to secure relief from the feed roll clearer roll sticking and refusing to roll continuously is shown in the accompanying sketch which shows the feed roll weight lever suitably cut out to accommodate the ends of the clearer roll.



FEED ROLL WEIGHT LEVER.

By cutting out about ¾ of an inch of this weight lever the clearer roll has nothing to come in contact with and consequently will roll continuously if attention is given to it occasionally to see that the ends are kept clean from lint, etc.

Both weight levers on the card should be suitably cut out and this can easily be done on an ordinary emery wheel in the machine shop. It is hardly necessary to go into any further explanation of this "kink" as it will be apparent to anyone working around the machines. Also, it is an easy matter to give the suggestion a try-out and see what it will do.

If any of your readers chance to be bothered with clearer rolls sticking I would advise them to try this method. When I first adopted this plan I found I had some rolls that would not roll after I had cut the corner out of the weight levers. However, I found these rolls were not straight or the roller cloth was not even enough on the outside and when I had these troubles fixed no more difficulty was experienced.

I shall be glad to see the experiences of some other carders on this question in the Discussion Department of COTTON and I shall also appreciate it if any readers who try this method of improving the work of the clearer roll will write a short letter to COTTON and tell us how it worked out.

I have never seen anything written on this subject, but if any of COTTON's readers are having any difficulty along this line it will well repay them to step over to the cards and look at the bad effects it gives and see if it is not worthy of a little more thought and attention.

A Carder (Georgia.)

HOW TO ANALYZE A STOCKING.

EDITOR COTTON:

An accurate analysis of a stocking is a very delicate and complicated matter and requires considerable experience in the knitting, dyeing and finishing ends of the manufacturing of hosiery. Often times the manufacturer obtains a sample of hose and he can readily determine certain of its qualities from former experiences, but for a correct analysis of the stocking the following form should be closely adhered to;

1—Whether full fashioned or seamless.
2—Gauge and size of machine knitted upon.
3—Size of yarn used.
4—Whether cotton, wool, silk or union fabric.
5—Nature of dye stuff used and how applied.

As I have stated, practical experience in handling hosiery in the different departments of the mill plays an important part in determining certain facts. Now, as to whether a stocking is full fashioned or seamless is readily ascertained by looking at the sample. If it is made without a seam up the back and along the bottom of the foot, and if there are no signs of its being narrowed in the ankle and arch of the foot, the stocking is seamless and was made on a circular machine.

Weigh the sample and calculate the weight of 24 stockings (one dozen pairs) and with a pick glass find the number of stitches per inch. Make sure of the size of the stocking by measuring from tip of toe to outside center of the bell, and the length in inches gives the exact size.

If a seamless stocking, count the number of stitches in one complete revolution of the hose and that will give the number of needles in the footer. If a half hose, count the number of stitches in a complete revolution of the ribbed top, divide by two, and this gives the number of needles in the cylinder and dial; then compare with the record sheets. There will be a smaller number of stitches per inch in the sample than in a similar stocking just taken from the machine with the same finished weight. This is caused by the pulling and shaping on the boards after dyeing.

Cut into the leg, ravel back about 40 or 50 yards of

yarn, if made of more than one thread, separate, weigh each, and calculate the size as follows:

(a) If for cotton or spun silk,

$$\frac{\text{Number of yards} \times 8\frac{1}{3}}{\text{Weight in Grains.}} = \text{Number of counts}$$

(b) If for worsted,

$$\frac{\text{Number of yards} \times 12.5}{\text{Weight in Grains.}} = \text{Number of counts}$$

We now have the size of the yarn, the number of needles in the machines and stitches per inch. From former experience and the record sheets we will readily determine the gage of the machine and the diameter of the cylinder.

To determine whether it is cotton, wool, or silk, dry and weigh a portion of the fabric, immerse for ten minutes with a cold solution of Nickel Hydrate in Ammonia, wash well, dry and re-weigh.

If silk was present it would have been dissolved, resulting in loss of weight. Boil the residue for ten minutes in a 5 per cent solution of Caustic Potash, this will dissolve any wool present, wash well, dry and re-weigh. The loss of weight represents the wool, while the residue consists of cotton. Calculate as to percentages of each.

As the formula for detecting the nature of dye stuff and how applied is too complicated to be described here, the writer refers the reader to "Manuel of Dyeing" by Knetch, Rawson & Loewenthal, Vol. 2, Page 867.

G. B. (New York.)

OVERCOMING LOOPER TROUBLES.

EDITOR COTTON:

Find the trouble first; be sure you are right and then go ahead.

Perfect looping at any hosiery mill means success for the company. The trade now-a-days are very particular about hosiery and especially about the loop seam. They want an unbreakable flat seam and the man who puts such goods as these in his show cases is sure of sales, while the fellow who has the tight seam across the toe does *not* have the sales. The seam should be flat and also elastic.

The fixers are largely responsible for bad seams. Some loopers are fitted with a trimmer and fabric guard, fabric roller and rotary brush. These things are of great importance and should be appreciated.

A few years ago in many mills the string work had to be sewed because the looper trimmers were not used so much. The transfer work was generally looped and could easily be raveled. Some particular styles could not be raveled well, so the operator would cut what is called the "clipping" off with a pair of seissors and she had a piece of card clothing tacked on a small piece of board which she would use to brush the selvage off.

The looper operator ought to put the work on straight because of the advantage she has over the old way of looping. Looper operators often times call the fixer and nine times out of ten she will say, "My machine is cutting stitches." The fixer will frequently raise the trimmer, not taking time to find the cause for the bad work. A few good rules that a looper fixer should practice when asked to fix a machine, say from cutting holes in the work, is first pull the stocking on the hand and stretch the toe with the fingers. By this means one can tell if the machine really cut the stitch or the needle dropped it. Ravel the rest of the stockings on the machine and see if they ravel down straight. If the goods are not looped straight, then there is room to think that the stitches were cut. *But don't raise the trimmer yet.* Start the machine and see if the fabric roller is turning as the stocking is passing. The gore stitch is very tender and if this roller is stuck it will cause the fabric roller to tear at least two or three stitches because this roller is worked by a spring and is used to roll the work close against the point ring so the trimmer will cut even.

Be sure the needle has a good point and that the machine is feeding perfectly. Even if the needle and feed is o. k. *don't raise the trimmer yet.* Remember it doesn't take as long to see if these things are right as it does to write them. What other fault remains to be found? The most important one of all, has the stocking been looped at the proper place? I venture to say there are fixers all over the country who don't know the proper place for a stocking to be looped to get the best results. I will try to answer this question.

The stocking should be started at the corner stitch and looped next to the heel yarn or splicing. Looper operators don't like to loop close to the heel yarn because the goods are a little tighter at that place, but that is the right place. A looper course is sometimes made in the work, but as a rule, work with a looper course will cut more than work that hasn't the course.

Why does a stocking with a loose course cut? Because the loose course makes the stitch long and too loose. The writer has had these things to happen and knows a loose course is not the best except on heavy work, something like 2¼ to 2½ pounds to the dozen, then a loose course is alright. But the loose course is not the thing for light work. When the goods have a looper course, the looper operator will loop it there. Otherwise some of them will loop above the place if there is no course, because the goods are looser. Hold the stocking between you and the light and it will at once be evident if they are looped at the proper place.

One can raise the trimmer so the blades will not cut, but that is not the thing. If the trimmer is raised and no holes appear is the stocking right? Not by any means. It might be asked what trouble can be found with the stocking if there's a good seam and no holes? It is this. You will be getting long corners or as someone has said "rabbit ears," because the stocking cannot be pulled down enough; there is some of the goods still in the stocking which should have been cut off by the looper trimmer. But the trimmer has to cut as the goods come around. The looper operator is responsible for the long corners.

If a fixer finds this kind of work it is his duty to show it to the girl and explain the necessity of the goods being put on at the right place.

The seaming yarn has something to do with the seam. A 50/3 is used for the needle and a 60/ on the hook side. The 60 is the covering side. The tension on the 50 should be tighter than on the covering side or the 60 should be loose. A good way to keep the seam clear of short strings when the cutters are not right is to clear the lint from the rotary brush.

The writer will be glad to answer any question anyone

may ask through COTTON. Also, later, a letter on the causes and remedies for stripping will appear in this department. Fixer (North Carolina.)

SLASHING.

EDITOR COTTON:

One of the most important things about slashing is the way the size is kept in the size box. I don't mean by this that it has to be watched all the time by the attendant, but it should be kept at a boiling point all the time that the slasher is in motion. It also is a good practice to raise the squeeze rolls from the sheet of yarn if the slasher is to remain stopped for more than five or ten minutes. This is a simple thing, but one that the writer thinks is overlooked by some slasher tenders.

For instance, suppose the set at the back has run out, the first thing an experienced slasher tender would do would be to raise the immersion roll clear out of the size box, and wash it, also the squeeze and size rolls, which will keep the sheet of yarn clear from the rolls, thus being sure that when the yarn is run through there will be no hard spots, owing to the rolls resting on the yarn. Still the writer knows and has seen slasher tenders leave their rolls down on the sheet of yarn for long periods instead of being up and well washed.

In a place where the writer worked he made a rule that all slasher tenders should open the size box valve before leaving at noon and night, so that when they returned the box would be dry, then the only thing needed was to simply put in the hose and wash it out clean, put in some new size, water and boil, therefore having the box clean all the time, new size and obtaining the best of results, although the writer will admit that it takes time. What of it, as long as one obtains satisfactory results?

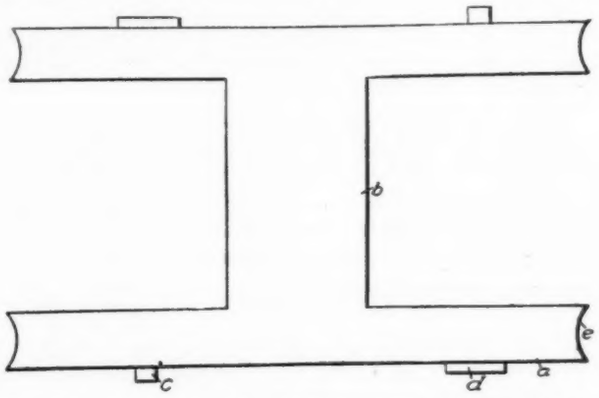
Another thing that the writer wishes to convey to the readers, and one that is often overlooked, is how many times has an overseer seen a slasher tender go around his machine and just open one size valve? Although the writer knows that there are machines that the size is controlled by a lever, that on opening the size on one side immediately opens it on the other, thus allowing an equal amount of size on the entire sheet of yarn, while passing through the size box.

One way for finding out whether the attendant is sizeing the sheet of yarn equally, is to go to the side where the attendant never opened the valve and pass your fingers through the yarn about where the first lease rod comes, which is close to the cylinder. If the yarn separates away from the leese rod instead of close to it, there has been very little new size put in on this side except what might come from the opposite side, then on watching the yarn on the other side of the slasher, where the atendant opens the valve every time he comes around, one can see that the yarn breaks or separates pretty close to the leese rod, thus showing that one side is getting all the size while the other gets very little. This is a bad practice and one that will cause trouble. Before going any further we must remember there are certain yarns that have to be sized heavier than others, therefore these certain yarns will feel very harsh and rough instead of soft and smooth, as is the case of those with a very light size, but on standing close to the first leese rod, one can see whether both sides are receiving the same amount of size.

The writer once saw size in a certain mill that was about four days old and still this slasher tender did not know enough to clean the box out and make new size until the second-hand told him. They had an order on 50's yarn and thus certain slasher was the one that had to run on spools (like the illustration) yarn from smaller spools that were on a creel at the back of the slasher. The other slashers would make the loom beam; each beam of this certain style carrying a few of these spools. While he was running this warp he would have the same size in the box day after day, instead of having new size at least once a day.

Another important point about the slashing process is, each and every slasher overseer should make it a rule that all slasher tenders should straighten the ends in the comb before the first two cuts are run, because it makes it easier for the weaver as the warp runs better.

I wish to ask the readers of this department what they consider would be the correct number of times that a slasher tender should oil his machine each week. I have personally found that oiling a slasher twice a week is as near to perfect running order as it can get. For the simple reason



that a slasher is a machine of heavy construction, and heavy duty, a little bit too much oil will do no harm and good results will be obtained, while not enough will cause it to run dry and wear out the bearings quickly. The writer has done little traveling through slashing rooms, but one thing that he has seen, and takes this opportunity in criticising, is the rule that some boss-slashermen make calling for the oiling of slashers every Monday.

Referring to the illustration of the spool just mentioned, (a) is the flange of the spool or sides as some call them, (b) is the barrel, (c) is a sort of an iron lug that projects from the outside of one spool into the socket (d) of another spool, they generally run four of these spools on a rod at the front of a slasher at a time, (e) is the groove on each spool. A spool like the one described will hold about twenty-five cuts of 50's yarn. Many a time the diameter of the barrel on different spools varies from 1/16 to 1/4 of an inch. An easy method to overcome this fault and one that gives good results is to take a strip of paper, about the width of the barrel, and roll it around, according to the variation on barrel diameters. Sometimes a strip of paper has to be rolled around the barrel four to five times, other times only once.

For the benefit of those who are not familiar with slashers the writer will show with figures the yards on the spool when it has on the twenty-five cuts, the gears are 31-79, that is 31 is the change gear, the constant for 79 gear is

19.75 ÷ 31 change gear = 63.7 yards in one cut. 63.7 × 25 cuts = 15,925 yards = 25 cuts, or length of yarn on the spool. Tab. (Mass.)

CLASSING COTTON.

EDITOR COTTON:

Having occasion, recently, to get in conversation with one of the readers of your Practical Discussion Deparmtent on the subject of stapling cotton, I found we seemed to differ most about how much the judgment of the different cotton classers varied on the length of short and long cottons.

Readers of these columns are familiar with the methods used by which an expert cotton classer determines the length or rather the average length of the staple of a given lot of cotton. The classer in stapling a lot of cotton, takes a hand full of it from the inside of the bale (the outside being dirty or damaged) and pulls it apart with his hands. He then discards one part and repeats the operation with the part remaining. By pulling and discarding the short fibers which are in the mass and held only by the cohesion with the other fibers and not by the bite of his thumb and forefinger, he finally secures a very small quantity of the cotton all of the fibers of which are parallel and straight and he then measures this with a rule.

Dr. N. A. Cobb, of the Department of Agriculture, has maintained that this method of stapling is very crude and unscientific, and open to serious errors. He declares that it makes a great difference just how far apart the cotton classer holds his hands, and how hard he presses the thumb and his forefingers on the cotton when he pulls it. That it is just as impossible to measure the pulled sample in the way described as it would be to measure the length of a fog bank, for all the fibers vary in length and it is impossible to say definitely where the cotton classer should start measuring or where he should end.

To bear out his statements Mr. Cobb told the mill men in Boston last April that he had found that cotton classers vary as much as three sixteenths of an inch in their judgment on short cotton and three-eights on long cottons. He said he had demonstrated by actual research investigation that the same classer would vary this much on different tests of the (same) cotton at different times. He had found that different classers would differ by this margin on the same cotton at the same time. He had proven this by sending samples of cotton to twenty expert cotton classers of this country.

Mr. Cobb suggested that cotton classers could arrive at more uniform results if they took the pulled cotton, cut it in half crosswise, turn the halves around together until the sample looked to be the same density along its entire length. Having done this the cotton classer would have two straight lines at each end of the pulled sample and he could easily measure the distance between them. If the pulled samples were placed between two pieces of glass and held near the window so that the light would shine through it, it would be possible to bring the two halves of the pulled sample so that the two rough edges just overlap enough to make the cotton exactly the same density from one end of the sample to the other. (This method was illustrated and described in the November, 1914, issue of COTTON.—Editor).

The writer has been present at quite a few exhibitions of shrewd cotton sampling when the cotton classer emphasized his boast that he could pull cotton to measure any length. Any one familiar with the structure of cotton fiber in the different forms will agree that it is possible to do this to a certain extent by a stretching or straining process. Particularly is this true with coarse fibred Texas cottons. Not only are these short fibers greater in diameter, but they stand the greatest strain or stretch without parting or breaking. The strength of the individual cotton fiber varies from about 80 to 305 grains, according to the kind of cotton and the part of the fiber selected for the test. Usually the long staple fine cotton stretches and breaks with the least strain and the rough, short thick cotton stand the greatest strain. Another thing which causes great obstruction along the lines of arriving at scientific cotton sampling is the immature, crude and undeveloped fiber which is apparent in nearly every bale to a certain degree by a bright transparent and glossy appearance.

Not only do these conditions of the structure leave the field open for shrewd cotton samplers, but also get many honest men in a tight place as well, thinking they have about the right distance between the hands or the correct pull or tension to take the harshness or curl out without stretching or weakening the fiber giving incorrect results.

L. C. (R. I.)

LONG CHAIN BEAMING.

EDITOR COTTON:

I wish some expert on long chain beaming would tell me some of the causes for excessive breaking of yarn at the beaming machines. What makes the threads stick and break at the raddle? What is the cause of loose threads in the chain? I will be glad to hear of anything that will improve the running of the beams. "X. X." (Mass.)

[This question contained an error last month and is reproduced in its correct form for the sake of clearness.—Editor.]

WORKING FINE COMBED YARNS.

EDITOR COTTON:

It is often argued that long staple cotton is worked too much on the pickers; that it is run through too many processes and that the beaters injure the stock and make it weak.

My idea is that the pickers are supposed to open and clean the stock, and if the intermediate picker is stopped I would like to know what means will be used to clean this stock as the finisher has a carding beater usually and it knocks out only a few motes? If the speed of the fan is not too great or the air currents not too strong, a great deal of dirt will fall, but the blade beater is what knocks out the motes.

The lower grades of peeler cotton are very trashy and dirty and when the cards are rushed with production they cannot do what the pickers ought to do. Neither can the combers do proper work unless the cotton has received careful preliminary handling.

I would like to have some experienced men give their opinions as to the best way to handle fine combed yarns in counts from 36's to 70's. Comber (N. C.)

"I believe that all persons have an equal right to the soil. The Maker of the earth has provided one home, not two homes, for each person, not two farms, but one farm for each farmer."

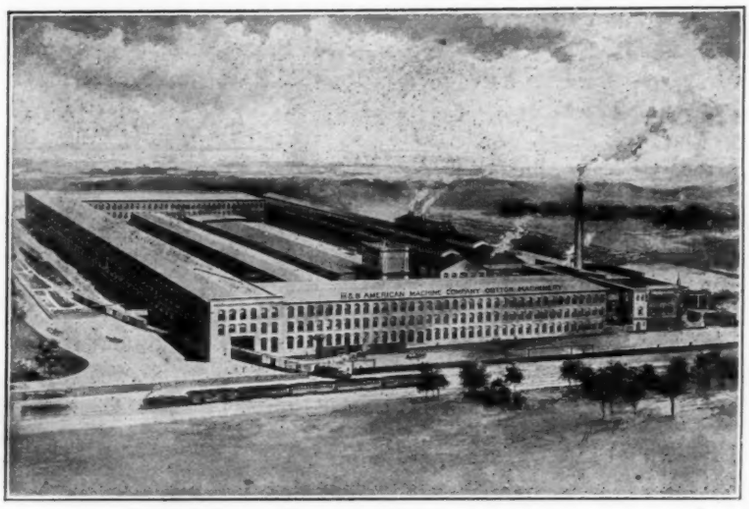
C. E. RILEY, Pres.
Boston Office
65 Franklin Street

Southern Offices
814-815 Empire Bldg.,
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

Notes About Men You Know.

NATHANIEL B. BORDEN, JR., retired treasurer of the Barnard Manufacturing Co., is going into the cotton goods brokerage business, and will probably locate in New York City. At present he is in New York making arrangements for his new field.

I. B. COVINGTON, who has been the effieient superintendent of A. P. Rhyne's mills for eight years, has resigned to accept the superintendency of a large mill at Forest City, N. C., of which S. B. Tanner is president.

GLADSTONE FISH has assumed the duties of overseer of the weaving department of the Davol Mills, Fall River, Mass., succeeding Theodore Tetrault, resigned.

WILLIAM O. TODD, treasurer of the Lawton Spinning Co. of Woonsocket, R. I., accompanied by Mrs. Todd and their son, Robert, will spend the summer at the Rockmere, Marblehead, Mass.

EDWARD H. RATHBURN, president of the Rathburn Knitting Company of Woodsocket, R. I., is spending the summer months at Seakonnet, R. I.

F. B. WHITAKER has accepted the position of carder and spinner at the Vardry Cotton Mills, Greenville, S. C.

J. P. MCRAE has, on account of ill health, resigned as president of the Dickson, Scotland and Waverly Mills, Laurinburg, N. C.

JAMES R. HOOPER, treasurer of the Slatersville Finishing Co., Slatersville, R. I., has resigned. His successor will be H. P. Kendall, treasurer of the Holliston Mills of Norwood, Mass.

J. W. RICHARDSON, purchasing agent at the H. & B. American Machine Co., has purchased a new 8-cylinder Cadillac.

KENNETH F. WOOD, superintendent of the Sayles Bleaching Co., Pawtucket, R. I., and Mrs. Wood have arrived at their country place, Nayatt, R. I., after a fortnight's stay in Newfoundland, where they went for the salmon fishing.

G. H. BARNHARDT has resigned as overseer of weaving at the Brown Mfg. Co., Concord, N. C., to accept a similar position at the Alta Vista (Va.) Cotton Mills.

CHARLES H. MERRIMAN, JR., of the Manville Co., Providence, R. I., and Mrs. Merriman and family are at their country home at Nayatt for the summer.

J. A. JENKINS, superintendent of the W. S. Gray Cotton Mills, Woodruff, S. C., will also be superintendent of the Vardry Cotton Mills, Greenville, S. C.

C. B. ARMSTRONG, president of the Armstrong, Clara and Dunn Mills at Gastonia, N. C., is spending a vacation at Wrightville Beach, N. C.

E. A. HOLT has resigned as overseer of carding at the Springstein Mills, Chester, S. C., and accepted a similar position at the Wylie Mills of the same place.

C. S. TATUM of College Station, Texas, has been visiting at Trion, Ga.

E. L. ADAMS has been promoted to overseer of carding at the Springstein Mills, Chester, S. C.

GEORGE F. HOFFMAN, of the Hoffman-Corr Manufac-

turing Company, Philadelphia, Pa., is being urged by his business associates and friends to become a mayoralty candidate. He is a member of numerous business, fraternal and neighborhood associations and has shown special interest in educational matters. He was a Republican presidential elector in 1900.

J. B. DRIVER, of Hope Mills, N. C., has accepted the position of superintendent of the Millen (Ga.) Mills, which will be put in operation at once.

CHAUNCY H. SEARS has resigned from the board of directors of the Charlton Mills, Fall River, Mass. The vacancy will not be filled at present, it is stated.

EUGENE SULLIVAN has resigned his position at Unionville, Conn., as boss carder and spinner, and intends to take a short rest before accepting another position.

W. E. FEARRINGTON of Elizabeth City, N. C., has accepted the position of superintendent of the Holt-Williamson Mfg. Co., Fayetteville, N. C.

C. M. POWELL, superintendent of the Cabarrus Mills, Kannapolis, N. C., has returned from a trip to the Exposition at San Francisco.

W. D. COOKSEY, one of the southern representatives of the National Ring Traveler Co., died recently in a private sanitarium at Columbia, S. C., following a short illness. Death was due to a complication of diseases. He was well known among the trade as a prince of good fellows.

R. S. REINHARDT, president of the Elm Grove Cotton Mills, Lincolnton, N. C., left this week for a trip to the Panama Exposition at San Francisco.

J. W. MCELHANNON has resigned as overseer of weaving at the Eureka Mill, Chester, S. C., and accepted a similar position at the Dan River Mill No. 3, Schoolfield, Va.

R. G. ADAMS, of the Fulton Bag and Cotton Mills, Atlanta, Ga., has accepted the position of overseer of weaving at the Eureka Mills, Chester, S. C.

E. S. TRAMWELL has resigned as overseer of carding at the Seneca (S. C.) Mills to become superintendent of the Cohannett Mills, Fingerville, S. C.

FRANK A. SAYLES, accompanied by Mrs. Sayles and their daughter, of Pawtucket, R. I., are spending the summer at York Harbor, Me.

G. G. ALLEN, of Prendergast, Tenn., has returned to his former position as overseer of carding at the Gibson Mfg. Co., Concord, N. C.

WILLIAM J. BROWN, president of the Woonsocket Business Men's Association, and treasurer of the J. B. Farnum Company, Woonsocket, R. I., is back on duty again after undergoing an operation for appendicitis.

E. B. NASH, of New Bedford, Mass., has accepted the position of boss carder at Fort Dummer Mills, Brattleboro, Vt.

J. R. TURNER has accepted the position of overseer of spinning at the Dan River Mills No. 3, Danville, Va.

J. F. MCENROE, assistant treasurer of the Ware Shoals (S. C.) Mfg. Co., is spending his vacation at Phillipsburg, N. J.

MATTHEW OUSLEY, for the past several months in charge of the mule spinning department of the B. B. & R. Knight Royal Mill at Riverpoint, R. I., has severed his connection with that company. Isaac Gourley of Chicopee, Mass., has been engaged as his successor.

ARCHIBALD S. FULLER, sole agent in this country and Canada for John Hetherington & Sons, Ltd., textile machinery manufacturers, Manchester, Eng., successfully underwent a serious operation recently, and his many friends will be pleased to know that his condition is favorable and that a rapid recovery is anticipated. This is the second major operation that Mr. Fuller has suffered within two years.

GEO. S. CAINE has resigned as overseer of bleaching and finishing at the Cannon Mills, Concord, N. C., to return to his former position as overseer of weaving at the Wamsutta Mills, New Bedford, Mass.

JOHN A. FERNLEY, the popular mill man, for a number of years connected with the Butler mill, and later superintendent of the Bristol Manufacturing Company, of New Bedford, Mass., has been appointed general superintendent of the Amedare Weaving Company, cotton dress goods, Central Falls, R. I.

J. W. MOORE has been transferred from overseer of carding and spinning at the Capital City Mill, Columbia, S. C., to overseer of carding and spinning at the Richland Mill, of the same place.

J. W. BROWN has been promoted from second hand in spinning at the Olympia Mill, Columbia, S. C., to overseer of carding and spinning at the Capital City Mill, of the same place.

J. F. ARMSTRONG has resigned as second hand at the Modena Mills, Gastonia, N. C., to become overseer of spinning and twisting at the Whitnel (N. C.) Cotton Mills.

W. L. STEPHENS of Salem, Ala., has accepted the position of overseer of weaving at the Lois Mill, Douglasville, Ga.

PETER DOCKRAY, the popular superintendent of the Lawton Spinning Company, of Woonsocket, R. I., is confined to his residence by illness.

C. M. FLOYD of Villa Rica, Ga., has become master mechanic at the Lois Cotton Mills, Douglasville, Ga.

W. T. SHAW, JR., of Danville, Va., has been made general superintendent of the Shaw Mfg. Co. and the Weldon Cotton Mfg. Co., of Weldon, N. C.

E. W. JOHNSON has resigned as overseer of spooling and warping at the Richard Mill, Columbia, S. C., and accepted a similar position at the Granby Mill, of the same place.

EBEN S. DRAPER, son of the late governor and Mrs. Eben S. Draper, who graduated from Harvard University in June, has started work in the Draper Co.'s plant at Hopedale, Mass. He is engaged in the drafting room, and will learn the business.

W. L. CARTER, formerly of Draper, N. C., has accepted the position of carder and spinner at the Social Circle (Ga.) Cotton Mills.

A. R. SHINN, of Bessemer City, N. C., has accepted the position of overseer of weaving at the Brown Mfg. Co., Concord, N. C.

BEN HALLOWELL, superintendent and manager of the Lymansville Company, Lymansville, R. I., and his wife have recently returned from an extensive trip across the country, having visited the Exposition at San Francisco.

SECRETARY ELDER, of the Boston Belting Company, is enjoying his annual vacation at Chatham, Mass., and rumor has it that he is putting on a coat of tan.

GEORGE A. WILSON has resigned as overseer of weaving and slashing at the Drayton Mfg. Co., Spartanburg, S. C., and accepted a similar position at the Fort Dummer Mill, Brattleboro, Vermont.

Union Station and Office Building of Atlantic Coast Line R. R. Co., Wilmington, N. C.
Architect—J. F. Leitner, Wilmington, N. C.
Chief Engineer—E. B. Pleasants
General Contractors—Boyle-Robertson Construction Co., Washington, D. C.
Roofer—A. Y. Bond, Greensboro, N. C.

MANY buildings have just "roofs." The contractor says "I'll build you a pitch and gravel roof"—and he does so.

It may be a *good* roof or it may be a *poor* one; yet a pitch and gravel roof is the best and most economical roof for any building—*provided it is built right.*

There is one sure way to eliminate all guess-work and chance—incorporate The Barrett Specification in full in your building plans and employ a responsible roofing contractor to do the work.

The result will be a roof which will give satisfactory service for 20 years and upwards, and that will show a unit cost (the cost per square foot per year of service) of about ¼ of a cent.

No other roof covering known can even approximate this figure. Remember that a Barrett Specification Roof is not a ready-made roofing. It is constructed on the building and is recognized as *standard* by technical men generally.

These roofs take the base rate of insurance and are approved by the Underwriters' Laboratories.

Hydronon
The Damp-proofing Paint

Construction expenses can be reduced by applying plaster directly on the brick or concrete without air space or lath construction. The use of Hydronon makes this practicable. This paint applied to the interior surface of the wall, seals it tight and furnishes a safe and dry base for the plaster. Booklet free on request.

Tar-Rok (Tar Concrete) Sub-Floors

The most suitable surface on which to bed plank where a wooden lower floor is desired in factories, storehouses, etc., providing a maximum of strength, rigidity and fire protection at a minimum cost. The planking is laid on the tar concrete while the latter is still soft, giving perfect solidity and making vibration impossible. The tar excludes dampness, provides a warm floor and protects the plank from decay. Booklet on request.

Special Note We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested. ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified and subject to the inspection requirement.

A copy of The Barrett Specification, with roofing diagrams, free on request.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle
THE PATERSON MFG. CO., Limited; Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, N. S. Sydney, N.S.

TRADE B MARK

A. L. BROWN, superintendent of the Cannon Mills, Kannapolis, N. C., gave a banquet recently to the twenty-five overseers in this mill.

VICTOR P. SAHNER has been engaged as agent for the Allen Hosiery Mills, Wayne Junction, Pa., formerly with the J. & B. Allen. The mill produces women's seamless hosiery.

ALEX MCCASKILL has been promoted from second hand in spinning at Mill No. 1 to overseer of spinning at Mill No. 2 of the Deep River Mills, Randleman, N. C.

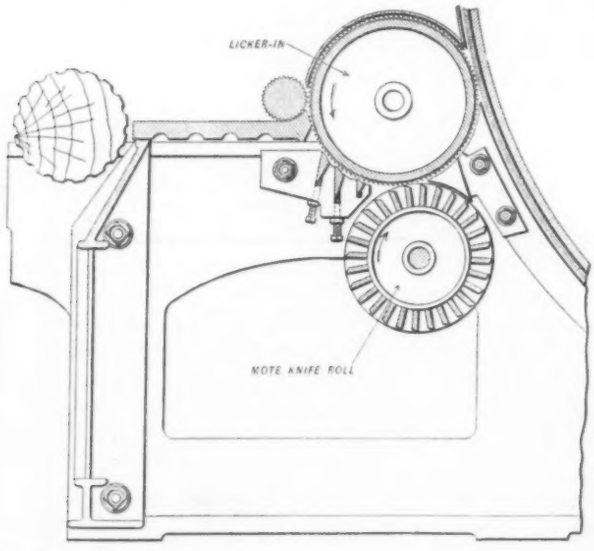
W. M. SMITH has resigned as superintendent of the Cohannett Mills, Fingerville, S. C.

New Machinery and Trade Notes.

The Mote Knife Roll.

The SACO-LOWELL SHOPS, 77 Franklin street, Boston, Mass., have recently applied a slowly revolving mote knife roll (Brady patent) under the licker-in to some of their cards, which are carding stock containing small specks and nits, obtaining gratifying results therewith.

The roll which contains 28 radial steel knives, ground to a true edge, is set close to the licker-in, and revolving slowly, takes from the licker-in short fly and small particles which the regular mote knives cannot touch. The construction of the roll is claimed to cut off undesirable air



drafts under the licker-in and give very satisfactory droppings. Because of this a sliver is produced which it is said shows a marked improvement, in the absence of broken leaf, nits, fly and all other small specks, which are quite difficult to remove in ordinary carding.

Correspondence is solicited from any who desire to improve their carding by eliminating more of this material from their card sliver, and full information and illustrated circular may be secured by applying to the address given or to ROGERS W. DAVIS, Southern Agent, Charlotte, N. C.

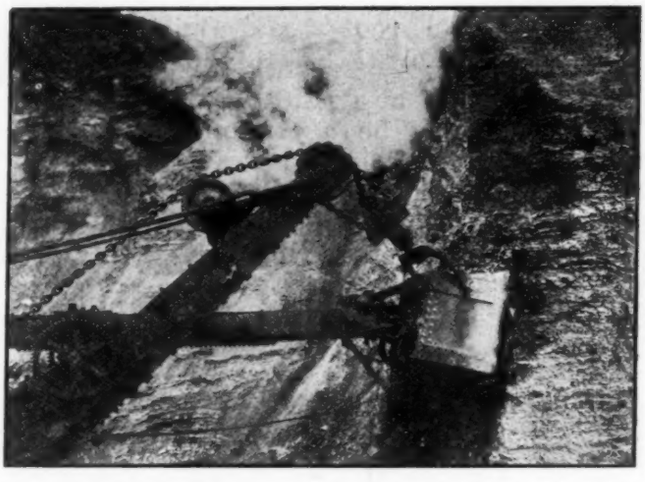
Becomes Oldest Traveling Salesman.

Arthur K. Ingraham, seventy-eight years old and forty-five years a salesman in the employ of the JOSEPH DIXON CRUCIBLE COMPANY of Jersey City, N. J., received a long letter the other day from his friend "Uncle George" Olney, in which the latter relinquished his claim to the title of Dean of Traveling Salesmen on account of his retirement over a year ago from active service with the Irving Pitt Manufacturing Company of Brooklyn, N. Y. Mr. Ingraham is two years the junior of his friend, "Uncle George," and in a photograph taken two years ago at a convention of the National Association of Stationers, he stands erect with a look of mental keenness which promises the satisfaction of holding for several years to come his newly acquired honor. Both Mr. Ingraham and Mr. Olney have been connected with the stationery trade during their entire combined service of over a century—a decade over for good measure. Mr. and Mrs. Ingraham celebrated their golden wedding seven years ago at their home in Mt. Vernon, N. Y.

Use Concrete for Permanence.

Slag leaves the furnace in the molten state at a temperature of 2800 degrees Fahrenheit, a much greater degree of heat than it is likely to ever again encounter. It is in itself a natural cement and has a wonderful affinity for either Portland or Slag cement. In the mix it is advisable to combine slag sand with ordinary bank sand, thereby adding greatly to the strength of the concrete. Bank sand is absolutely inert and acts only as a void filler.

While slag weighs only 2000 pounds per cubic yard, it makes what is claimed to be the strongest and lightest con-



crete obtainable. Think of it! Every time you lift a cubic yard of stone or gravel, you have paid freight, wagon haul and handling on 2600 to 3300 pounds of material. What's the use of incurring this 25 to 50 per cent additional expense when you can build stronger and more fireproof with concrete made of slag?

The illustration shows a steam shovel handling slag at the pit. Full information concerning this wonderful material for concrete work may be secured by writing the BIRMINGHAM SLAG CO., Birmingham, Ala.

"You Can '*Throw a Cat Thru*' The Hole in These Caps"

MADE FOR HEAVY PAIR OF WIRES
CAPS SLIP OVER THE WIRE FAST
CAN'T TWIST THE WIRES

P & S 488 Key, ⅜" Cap.
P & S 448 Keyless, ⅜" Cap.

CAST ALUMINUM CAPS
PHOSPHOR-BRONZE MOVEMENT
ALL FRONT CONNECTED

"IF 'TIME' COUNTS USE P & S."

P & S 241 Keyless, ½" Cap.
P & S 485 Key, ½" Cap.

WRITE FOR SAMPLE ON YOUR LETTER-HEAD.

PASS & SEYMOUR, Inc.
SOLVAY, N. Y.
NEW YORK CHICAGO SAN FRANCISCO

Good Weavers Favor Loom Production
Shambow Shuttles Are Good Weavers.

To Weave Better Cloth and More of it Per Loom, and at less Cost for Supplies, get in touch with

Shambow Shuttle Company
Designers of Efficiency Shuttles
Woonsocket R. I.

APPLICATION FOR EXHIBIT SPACE

AT THE

SOUTHERN TEXTILE EXPOSITION

GREENVILLE, S. C.

NOVEMBER 2nd to 6th, 1915

To the Executive Committee,

Greenville, S. C.

Dear Sirs:

The undersigned herewith applies for..... (.....) square feet of space (standard sections 6 x 8 feet) at the Southern Textile Exposition, this space being indicated by number ..... on the floor plan which you will send with your acknowledgement.

In making this application, the following conditions are agreed to:

That this space is to be paid for at the rate of 25 cents per square foot, one-half of which amount is herewith enclosed, (same to be refunded in full if this application is not accepted by the Committee), and the other half to be paid upon the arrival of the exhibit at the Exposition Building. It is agreed by the Committee that any funds remaining after all expenses are paid, will be rebated on a pro rata basis.

That the above charge is to cover only the floor space with railings; special decorations, furniture, motors, power, special wiring and other requisites will be furnished at nominal prices by the Committee, the cost of these items to be paid by Exhibitor on presentation of account.

That all exhibits are to be shipped to: "Southern Textile Exposition, Section No. (number as given on plan), Greenville, South Carolina." Exhibits are to be insured by the Committee from loss by fire while in the Exposition Building to three-fourths their actual value. The Committee will take all reasonable care to protect exhibits from breakage or other damage but the Committee's responsibility extends only to the insurance indicated above.

That upon arrival in Greenville, the exhibit will be unloaded and placed in its proper section by the Committee, the cost of this to be paid by Exhibitor on presentation of account.

That all indebtedness to the Exposition will be settled in full before exhibit is removed from the Building. (All checks to be made payable to Edwin Howard, Treasurer.)

Very truly yours,

.....

By.....

Application dated 1915,

At.....

Greenville, S. C. .....1915.

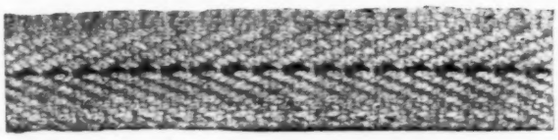
Accepted: Southern Textile Exposition,

.....

For the Executive Committee.

(Duplicate contract will be executed and returned with floor plan).

CUT OUT THIS PAGE AND USE IN APPLYING FOR SPACE.



American Textile Banding Co.

(Incorporated)

Third and Moore Streets

PHILADELPHIA, PA.

Manufacturers of SPINDLE TAPES and BANDS

MR. MANAGER:—

You are interested in some, at least, of the following items, and we are interested in you having them in the best shape at the proper time:

1—Seed and Meal Tags.
2—Warehouse Receipts, printed or lithographed.
3—Warehouse Tags.
4—Gin Tickets.
5—Tag Hooks and Wires.
6—Cotton Talley Books.
7—Cotton Books, for Bought and Sold Cotton.
8—"Montague" Addressing Machines for Shipping Tags, etc.

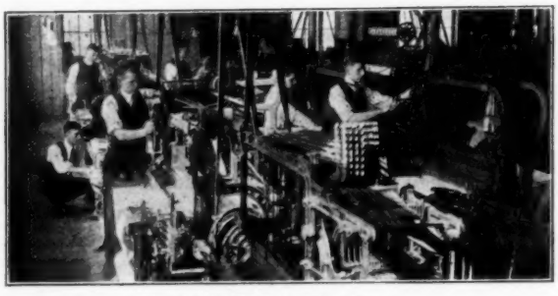
What are your requirements for the coming season? Let us serve you. Write us now!

ROBERTS & SON

The Printers and Stationers, Birmingham, Ala.

TEXTILE ENGINEERING

GEORGIA SCHOOL OF TECHNOLOGY



Practical Work in Weaving.

THE SOUTH leads the world in cotton growing and will soon lead in cotton manufacturing. To hasten this result more southern men must be trained for leadership in the textile industry.

The Textile Department of the Georgia School of Technology has an equipment which for variety and completeness is unsurpassed. Every process from the raw cotton to the finished fabric is thoroughly taught.

Two courses are offered: A four-year course leading to the degree of B. S. in T. E.; and a two-year course leading to a certificate in T. E.

Courses are offered also in ELECTRICAL, CIVIL, MECHANICAL, AND CHEMICAL ENGINEERING, CHEMISTRY, ARCHITECTURE, AND COMMERCE.

For catalog or further information, address K. G. Matheson, Pres., Atlanta, Ga.

You Will Be Delighted With

Howe Mill Crayons

Try Them and See

Howe Mill & Crayon Co.,

LOWELL, MASS.

Free Samples on Request

CHINA CLAYS AND TALCS

Adapted for

Loading and Finishing

DUNN & KRUSE

MAIN OFFICE, 180 SOUTH ST., NEW YORK

The Walsh & Weidner Boiler Company

CHATTANOOGA, - - TENNESSEE

Horizontal Return Tubulars
Heine Type Water Tube
With or Without
STEEL CASINGS
Towers and Tanks, and all Types of Special Plate and Structural Work

Diamond FIBRE

ROVING CANS
MILL BASKETS
BARRELS BOXES

Will neither dent nor break when subjected to hard usage. Stronger than wood, lighter than steel.

Write for Bulletin 12.

DIAMOND STATE FIBRE CO.

Bridgeport, Pa. Elsmere, Del.

Branches in Principal Cities.

BOOK REVIEWS

All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.

Davison's Textile Blue Book, 1915-16. 1100 pages. Price, office edition, $4.00; pocket edition, $3.00; salesmen's directory, $3.00. Published by the Davison Publishing Co., New York.

The publishers announce the completion of the "twenty-eighth annual edition" 1915-1916, which shows the mill reports thoroughly revised. About four hundred manufacturers have been taken out and over four hundred new concerns have been added. Thousands of changes in mill names, officers, goods made, equipment, selling agents, etc. have been made, and the various dealers and other allied lines have been brought up-to-date.

The Blue Book is really twenty-one directories in one volume as follows: Directory of Cotton Mills; Woolen Mills; Worsted Mills; Silk Mills; Knitting Mills; Jute, Linen and Flax Mills; Canadian Mills; Dyers and Finishers; Mills with Dye Houses; Commission Merchants; Cotton Dealers; Wool Dealers; Hair Dealers; Waste Dealers and Manufacturers; Mattress Makers; Textile Supplies; New Textile Mills; Classified Directory of Mills; City and Textile Maps, and is the only textile directory issued with thumb indexes for quick references.

Two editions are issued, the office size, 1100 pages, with heavy cloth binding, is printed on the plate paper with a large page and contains all the above features, while the pocket edition, 1000 pages printed on thin paper with flexible cloth covers, has all the features given in the office size except the Classified Directory of Mills and Textile Supply Directory.

The Salesmen's Directory, bound in flexible leather, size 3½ x 5¾ x ½ inch thick, is much smaller than the pocket edition, but has a full report of every mill, dyer, etc., these being arranged alphabetically, all mills under each town, different from the Blue Book, which subdivides into Cotton, Woolen, Silk, etc.

Clark's Directory of Southern Cotton Mills. Edition of July 1st, 1915. One hundred and fifty-two pages. Vest pocket size. Price $1.00. Published by the Clark Publishing Company, Charlotte, N. C.

This is the regular semi-annual edition of this very convenient little pocket directory of the Southern cotton mills. It contains all the known changes in the officers of the mills, gives the names of the buyers for each mill, indicates the class of goods manufactured, carries an alphabetical index of all these mills, carries textile maps showing the location of the mill towns and their relation to the railroads, and also carries a supplementary index for traveling men, giving the names of the principal buyers, their business offices and the mills for which they buy. This latter section is an exclusive feature in this directory.

The American Directory of the Knitting Trade. 1915 edition. 695 pages. Price $1.50. Published by Lord and Nagle Company, Boston.

This directory, which has now reached the thirty-third year of its publication is the standard work of its kind and contains a full report of every knitting mill of record in the United States and Canada arranged alphabetically by states and towns; giving capitalization; names of the officers, including superintendent and buyer; kind of goods made; number of knitting machines and kind; number of sewing machines; whether the mill dyes, bleaches or finishes; the kind of power used; the selling agents; and the kind and sizes of yarn bought. This directory also contains special copyrighted maps of the mill districts, carefully classified index of manufacturers, an alphabetical index of manufacturers, manufacturers selling agents and commission merchants, knitting yarn manufacturers, a list of dyers, bleachers and finishers, and other interesting material related to this end of the textile trade.

British India. No. 72 in the series of Special Consular Reports. Price $1.00. Published by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

In an effort to stimulate interest in the Indian market and to emphasize the salient aspects of the trade, the Bureau of Foreign and Domestic Commerce has just issued a handbook of about 640 pages, dealing with the resources, industries, and commerce of India. This book contains many illustrations, a large detailed map, and facts concerning a multitude of Indian activities and conditions. It describes thoroughly the trade in all important imports. Every subject having a bearing on trade and its expansion has been covered. There are interesting accounts of the Native States, and of Ceylon, Afghanistan, and Tibet. This volume, which is regarded as one of the most valuable publications ever prepared by the Bureau, may be obtained for $1 from the Superintendent of Documents, Washington, D. C.

Steam Drainage and Boiler Feeding is the title of a booklet recently issued by the Morehead Mfg. Company, Detroit, Mich., describing at considerable length and with numerous illustrations the Morehead "Back to Boiler" system. This booklet is full of illustrations of practical installations and letters demonstrating the saving in fuel and dollars resulting from the installations illustrated and described. It contains much material of interest to those cotton manufacturers desirous of obtaining more efficient service from the power plant. A copy of this interesting booklet may be had upon application to the manufacturers.

Best Automobile Tires for Hard Use.

Some automobile tires give very fine service when given ordinary use but when subjected to service over rough and rugged roads, worse than the ordinary, or over hard flinty streets they very often go to pieces. The tires for most severe service are Double Service Tires which are the product of the Double Service Tire and Rubber Co. of Akron, Ohio. These tires are made with a double thickness of tread which imparts on an average of 12 plies of fabric and one inch of service rubber. This is like putting an extra sole on a shoe. The results in service being the same in comparison. This tread is so thick that punctures are practically impossible yet the tires contain the same air space, and the same pressure, as is used in many other makes so their resiliency and riding qualities are the same, and are guaranteed 7000 miles service.

Spinning Tape Specialists

Established 1898

Makers of tape for all kinds of tape drives and all makes of machinery. Makers of listings, leaders and all kinds of mill tapes

Write Us

BARBER MANUFACTURING CO.

LOWELL, MASS.

WHY BUY GALVANIZED ROOFING AT THE PRESENT HIGH PRICE FOR SPELTER?

28 years ago we began making Cortright Metal Shingles of tinplate, painted, and ever since then they have been proving that they last as long as galvanized roofing, and give the same satisfactory service.
In fact, they are responsible for the present, country-wide demand for metal shingles. Just forget the soaring price of Spelter. Put on Cortright Metal Shingles painted red or green. Now is the best time. Write for particulars.

Cortright Metal Roofing Co., Philadelphia and Chicago.

JOHN D. LEWIS

Manufacturer of

Logwood Extracts & Hematine

Providence, R. I.

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which **add at least 50% to its value to YOU.**

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVINGS WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write me.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

ALUMINA SOAPALITE

THE MINERAL SOAP

THE DETERGENT WITHOUT AN EQUAL

Washes thoroughly and quickly—rinses freely. Brightens and sets colors.

BOOKLET FREE

THE ELECTRIC SMELTING & ALUMINUM CO.

Lockport, New York

SAFETY FIRST — ECONOMY renewable cartridge FUSES

WHY spend four times more than necessary for Annual Fuse Maintenance? Some of the large mills of the cotton industry have realized that electrical protection may be secured at a saving of 80% a year over old-style methods by using

ECONOMY renewable cartridge FUSES

Glad to send free samples to any engineer, electrician or plant manager in the cotton industry. Ask for list of users and Bulletin No. 7.

ECONOMY FUSE & MFG. CO.

Kinzie and Orleans Sts., Chicago.

"Look for the Gray Shell."

KNITTING MILL NEWS

Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.

GEORGIA.

ATHENS.—The Holland Manufacturing Company has been incorporated with a capital stock of $100,000 for the purpose of manufacturing men's and women's hosiery.

MASSACHUSETTS.

BOSTON.—The Globe Knitting Co., knit goods, has been incorporated with a capital stock of $20,000 (200 common shares of par value, $100). Incorporators: President, David M. Gold, 26 shares; treasurer, William Sedlis, 3 Intervale street, Boston, 25 shares; clerk, Joseph L. Rogers, 1 share, and Frank Stoloff, 26 shares.

NEW HAMPSHIRE.

ASHLAND.—According to report, the Ashland Knitting Co., woolen seamless hosiery, is erecting a power plant for the operation of its mills.

NORTH CAROLINA.

FOREST CITY.—W. P. Leister, recently mentioned as to establish knitting mill at Forest City, N. C., is of Columbia, S. C., and has arranged for the Forest City plant. About 12 machines will be installed to begin with. A 60x40-foot building for the mill is in course of construction.

PENNSYLVANIA.

PHILADELPHIA.—Henry Brown, recently of Brown, Aberle Company, hosiery manufacturers, Palethorp and Huntingdon streets, has made application, with a number of others, to incorporate as Henry Brown & Sons Company, to manufacture cotton, lisle and silk hosiery. Mrs. Elizabeth Brown, William Brown, John H. Brown and Victor W. Wills are the other names in the application. The firm will be located in the Model Mill, Ontario and Kensington avenues, where it has installed 24 full-fashioned knitting frames.

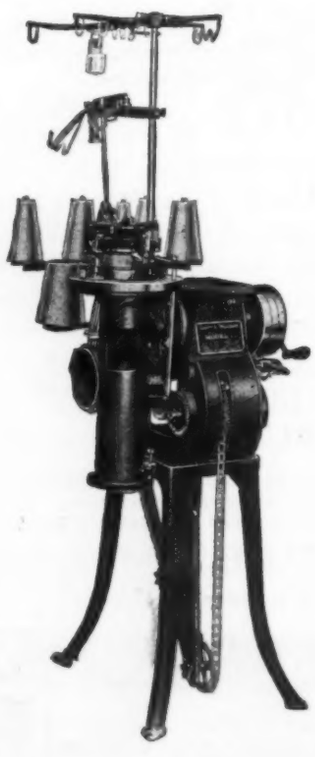
PHILADELPHIA.—The Pigeon Knitting Co. has moved to 4715 Edgemont street, Bridesburg, from 746 East Westmoreland street.

READING.—John Blood & Co., of Philadelphia, are completing a large branch hosiery mill in Boyertown, this county.

READING.—The Charles H. Cox interests will open a new underwear factory in this city soon.

SPRING CITY.—Two Spring City plants are very busy. The Century Knitting Co. is enlarging its Pottstown branch and plans to turn out 1,250,000 knit undergarments in the next 12 months. The Keystone Stocking Mills are running two sets of employees, one in the day and one at night, one making cotton hosiery and the other woolen. Other knitters here are working overtime.

SELLERSVILLE.—F. E. Munich, a Philadelphia hosiery manufacturer, has leased for six years a large factory on Main Street of this town. He is to remove his Philadelphia plant to this place to manufacture hosiery by a new patent process.



Our Hosiery Machines

automatically set up and drop off each stocking and make the anti-ravelling course, and, in addition to the cost of transferring the cuffs of half hose and the sewing of the welts of women's hose, these machines effect very pronounced savings, for instance—in the case of half hose, the ordinary ribbed machine is eliminated entirely, and, of course, the first cost of this machine, its maintenance and floor space, together with the knitting waste, the cost of cutting the ribbed top and the ravelling waste, which in the ordinary practice is unescapable, are entirely saved.

Transfer menders are altogether eliminated and the expense and annoyance of training expert help is avoided.

In respect of the women's hose there is no expense for severing the stockings, no sewing machine operation and consequently no waste on account thereof and a marked decrease in loopers ravelling waste, due to the fact that the stockings are pressed off to a course and not left with a crooked unevenly cut edge.

Established 1865.

Scott & Williams, Inc.

88 Pearl Street
BOSTON

NEW YORK **UTICA**

MERCERIZED YARNS

Dyers—Bleachers—Gassers

Dyers of

Colors Fast to SUN and BLEACHING

ABERFOYLE
Manufacturing Company

CHESTER, A.

402 Morris Building
PHILADELPHIA

CHICAGO
746 Insurance Exchange

Clinton H. Scovell & Company

Certified Public Accountants
Industrial Engineers

110 State St. CHS&Co CERTIFIED PUBLIC ACCOUNTANTS MASS AND N.Y. Boston, Mass.

Textile Cost Accounting

American Soap & Washoline Co.

Established 1861.
COHOES, NEW YORK
Largest Manufacturers of Textile Soaps and Soap Powders in the United States.

FOR ALL COTTON MILL USES.

The following concerns are now handling our Goods and will supply you at Factory Prices.

Waters-Garland Co., Louisville, Ky.; Carolina Supply Co., Greenville, S. C.; Southern Belting Co., Atlanta, Ga.; Montgomery & Crawford, Spartanburg, S. C.; Sullivan Hardware Co., Anderson, S. C.; Charlotte Supply Co., Charlotte, N. C.; McAnelly Hardware Co., Huntsville, Ala.

DOBBINS SOAP MFG. CO.

PHILADELPHIA
Makers of the Celebrated
Dobbins Cotton Softener
Also
Olammon
(A concentrated Scouring Compound)
and
DOBBINS ELECTRIC MILL SOAPS
Working Samples Cheerfully Furnished Gratis.

C3 TRADE MARK

73 to 75 PER CENT PURE
CLARIFIED
CONCENTRATED
GRANULATED
CALCIUM CHLORIDE

Used by the largest Cotton Mills, Print Goods Manufacturers and Sizing Makers.

Write for Prices and Full Information.

Carbondale Calcium Company.

Home Office: Carbondale, Penna.

Branch Offices:—New York, Boston, Pittsburg, Philadelphia, Chicago, Baltimore, and New Orleans.

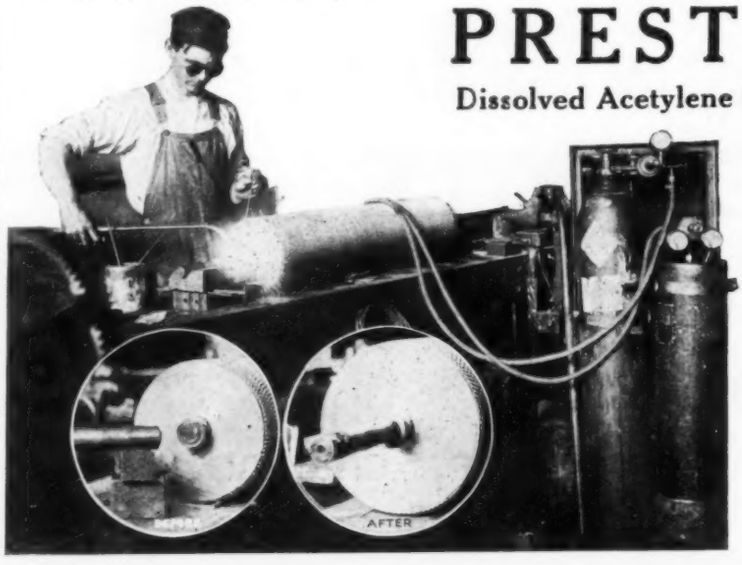
A Typical Saving Made by

Oxy-Acetylene Welding in Textile Mill

Think of the time that was saved, and the costly replacement avoided by being able to make this repair of a broken shaft on this "licker-in," immediately—without taking it from the mill shops.

This is just one of the numerous examples in the textile milling industry where efficient oxy-acetylene welding equipment makes tremendous savings.

Right now—in all probability there are repairs in your equipment needed—that this process will simplify, better and cheapen.



PREST-O-LITE

Dissolved Acetylene (Ready Made Carbide Gas)

puts this process in easy reach of every mill shop.

Simple, portable apparatus is made most efficient and widely useful.

We furnish a thoroughly high grade welding apparatus for $60.00, not including acetylene cylinders which are extra and are furnished under a liberal service plan. Truck and special equipment for cutting operations at extra cost.

If you use acetylene for ANY purpose you should know about Prest-O-Lite Acetylene Service, which furnishes the highest grade of Dissolved Acetylene in portable cylinders, used as conveniently as you use cylinders of oxygen. Saves the large initial outlay and heavy depreciation, trouble and inconvenience of making crude Acetylene in carbide generators. Besides, Prest-O-Lite Dissolved Acetylene is perfectly dried, cleaned and purified—makes better welds and is cheaper to use.

Send for Helpful Information.

Get this instructive literature, showing actual instances of savings made and how you can apply this process with profit to your work.

The World's Largest Makers of Dissolved Acetylene.

The Prest-O-Lite Company, Inc.

836 Speedway, Indianapolis, Ind.

53 direct factory branches and charging plants in principal industrial centers.

Increasing Market for Southern Coals.

THE SOUTHERN COAL & COKE COMPANY of Knoxville, which with associated companies operates eleven mines in the Tennessee-Kentucky field, has just secured a contract for 40,000 tons of coal to be delivered from its Dixie Gem mine to the Big Four railroad. This is the first contract ever placed in this field by the Big Four, which uses several million tons annually. The order was placed after an exhaustive test by the Big Four in comparison with other coals from other fields. During the same week, the Southern Coal & Coke Company placed other large contracts aggregating a quarter of a million tons to be delivered in the next twelve months. This company recently entertained as its guests at its mine and at the main offices in Knoxville, a number of large retail coal dealers, including W. M. Schaefer, Frank Suhr and W. R. Hoag of Cleveland, O.; Henry Bauchkneeht, Muskegon, Mich.; and Julius Knack of Detroit. The Southern is now shipping coal from Florida to Michigan and as far west as the Dakotas.

In case there is any difficulty with sizing or finishing, or when some improvement in this respect seems desirable, THE ARABOL MFG. CO., 100 William St., New York City, will be glad to render assistance. Scientific specialization, long and extended experience, modern facilities in factory and laboratory enable them to meet any condition. They are continually adding to the staples that have made them popular with the textile trade.

Courtesy has been aptly compared to an air cushion, which, although there is nothing in it, eases our jolts wonderfully.

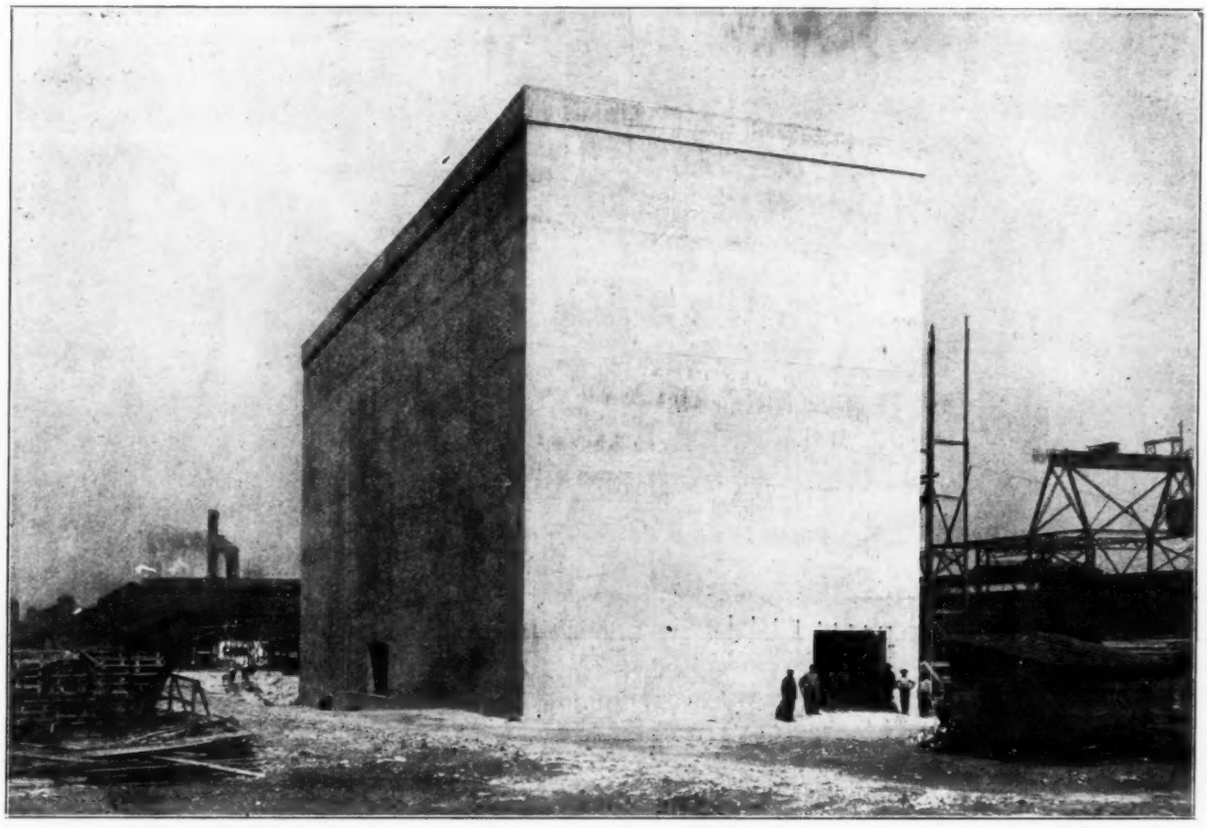
Lubrication Waste in Textile Mills.

One of the most difficult and expensive problems with which mill managers have to contend is the question of proper lubrication of textile machinery as well as the loss in power and loss from damaged goods through oil stains. To meet this problem from an expert point of view, the NEW YORK & NEW JERSEY LUBRICANT CO., 165 Broadway, New York, have organized a department for the study and advice on textile machinery lubrication. The men of this department are all former mill men having a thorough knowledge of textile mill machinery. Their specific duty is to conduct tests in the various departments of the mills and show exactly what lubricant is best adapted to each machine and which will most effectively overcome friction and keep down maintenance cost as well as insure freedom from damage to goods in process. Also to prove exactly the saving that can be affected through the use of non-fluid oil instead of fluid oils and ordinary greases.

Suggestions and advice from this department is furnished without obligation to any mill owner, superintendent or engineer interested in the subject of better lubrication and economy of operation. A most comprehensive textbook on this subject has been prepared and both textbook and advice will be sent without obligation. A request addressed to the New York & New Jersey Lubricant Co., 165 Broadway, New York, asking for full particulars will receive prompt attention.

Announcement has been made of the death, on July 3d, of Robert Child Scott, secretary and treasurer of the MORRIS MACHINE WORKS, Baldwinsville, New York.

A Reinforced Slag Concrete Building is Really
Fireproof and Indestructible from Natural Causes



This building is constructed entirely of slag concrete made up of Universal Portland Cement, Akron sand and ¼" to 1½" slag. The sand contained on an average 5.9% of loam, but was a fairly good material. The cement was standard in all respects.

The walls, ranging in thickness from 20" at the bottom to 12" at the top, are not reinforced and are constructed of a 1:3:6 mix concrete. The columns are reinforced with steel latticed columns of sufficient strength to carry the entire dead load during the construction of the floor above. A mix of 1:2:2 was used on the columns, the slag being cut down in this mix in order to make an excess of mortar to insure a smooth job outside of the lattice work of the steel reinforcing. The floor system is made up of steel I-beam girders entirely encased in concrete, the floor itself being reinforced with American Steel & Wire Company triangular mesh reinforcing. A mix of 1:2:4 was used on the floor system up to within about 2" of the floor level, and on this was placed the finish of 1 to 2 mortar.

The building was completed in September, 1914, and has so far shown no defects whatever.

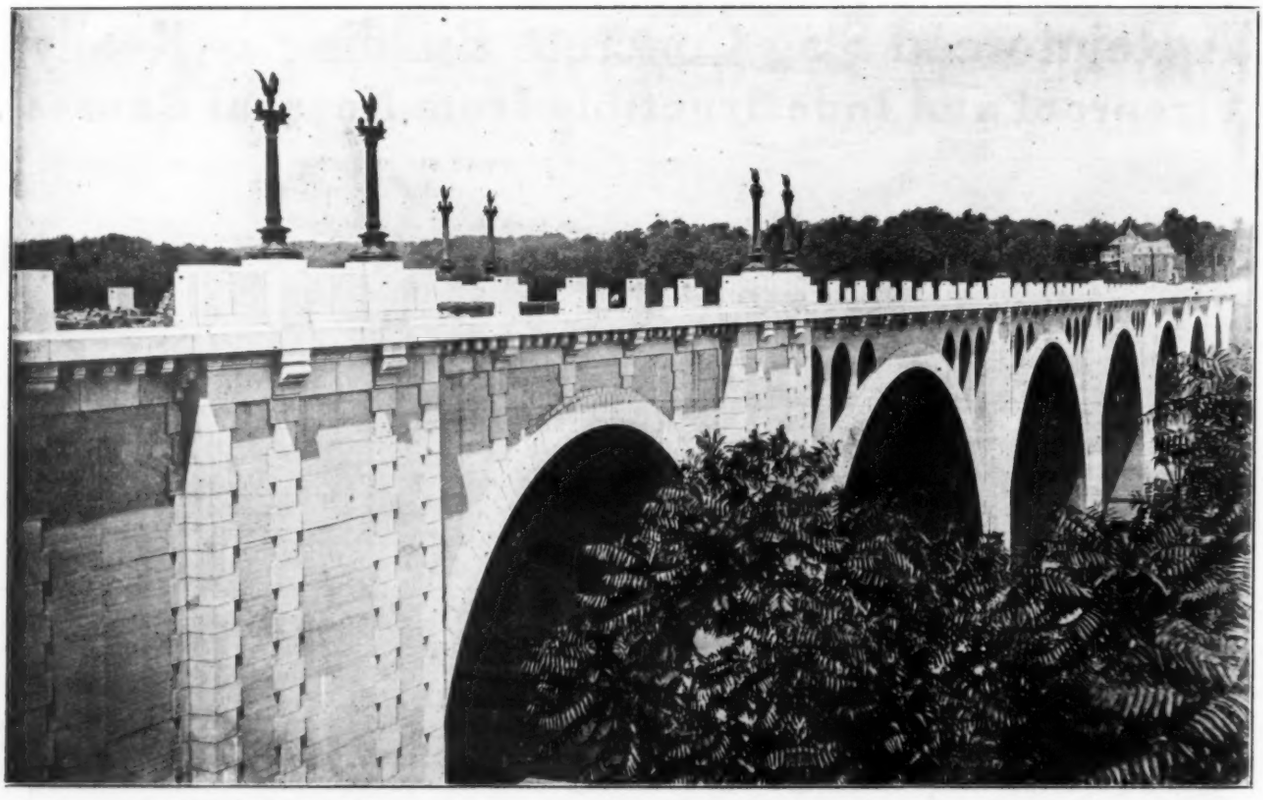
SLAG leaves the furnace in the molten state at a temperature of 2800° Fahrenheit, a much greater degree of heat than it is likely to ever again encounter.

¶ Slag is in itself a natural cement and has a wonderful affinity for either Portland or Slag Cement. In the mix it is advisable to combine slag sand with ordinary bank sand, thereby adding greatly to the strength of the concrete. Bank sand is absolutely inert and acts only as a void filler.

¶ Slag weighs only 2000 pounds per cubic yard and makes the strongest and lightest concrete obtainable. Think of it—Every time you lift a cubic yard of stone or gravel, you have paid freight, wagon haul and handling on 2600 to 3300 pounds of material. What's the use of incurring this 25 to 50% additional expense when you can build stronger and more fire-proof with concrete made of slag.

¶ For information in full, communicate with

BIRMINGHAM SLAG CO., Birmingham, Ala.
DIXIE ENGINEERING & INSULATING CO., Atlanta, Ga.



Rock Creek Viaduct, Washington, D. C. A monu mental Concrete Bridge of Strength and Beauty.

Permanent Monolithic Concrete Bridges.

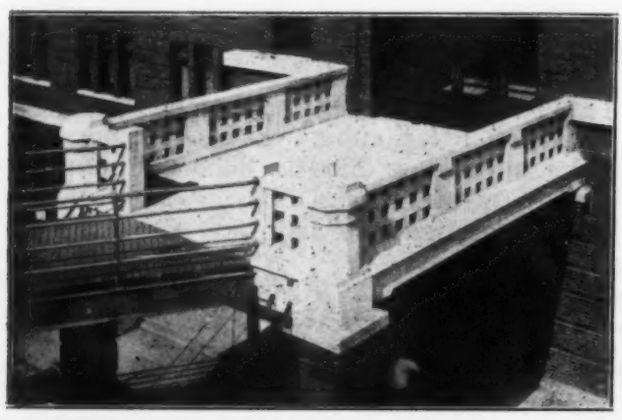
THE rearing of great arches in the form of bridges and aqueducts has appealed to engineering science of all ages, but the modern engineer has at hand a material which has largely increased his resources in construction of this character, especially as it concerns durability, economy and variety of design.

This remarkable material is concrete. While concrete was used centuries ago in foundations and edifices, where it still survives, its highest value as applied to the building of bridges is entirely modern. It is now used in every known form of bridge construction, from the small highway culverts on rural roads to the splendid bridges spanning many rivers and streams or the great viaducts built in large cities.

Much of the success attending the construction of concrete bridges, both as to beauty and permanence is due to the fact that concrete is a plastic material. It may be cast in any form and so designed as to be in harmony with its environment. It is especially adapted to structures in contact with water, which is an important economic advantage in the building of bridges.

Concrete Bridges Withstand Floods and Freshets.

Concrete bridges are great monoliths, huge masses of solid stone from the foundation up. They can be designed to withstand the stress of the swiftest currents. Of all the bridges built across the Miami River, at Dayton, Ohio, only those of reinforced concrete withstood the tremendous floods that occurred in 1913. In Sandusky, Ohio, a con-



An imposing entrance to the plant of Armour & Company, Chicago.

Combined Highway Bridge and Live Stock Subway.

ADVERTISEMENT

crete bridge emerged intact after being buried under 18 feet of swiftly-moving water.

Why Concrete Bridges Are Now the Prevailing Type

They mean true economy. First cost alone should never govern in selecting a type of bridge. Long life, durability and low maintenance cost should determine the matter. Thus provision is made for the future as well as the present, for those who come after should not be burdened with excessive bridge levies. It is, therefore, the more reasonable policy to base the selection of type on actual ultimate costs, so that yearly expenditures be made as small as possible. Before coming to a final conclusion there should be considered all customary items usually specified as inspect on, depreciation, sinking fund, painting and interest on first cost. For example, in determining the type of the Vermillion River Bridge, at Wakeman, Ohio, comparative estimates were made as follows:

The cost of a reinforced concrete bridge was estimated at $17,900.

The cost of a steel bridge was estimated at $14,800.

Yearly costs were estimated as follows:

	Steel	Concrete
Yearly cost of inspection	0.5%	0.5%
Depreciation and consequent sinking fund	5.0	2.0
Cost of timber maintenance	4.0	
Cost of painting	2.0	
	11.5	2.5
Interest on first cost	5.0	5.0
	16.5	7.5

Yearly cost: Steel @ $14,800 = $2,440
Yearly cost: Concrete @ 17,900 = 1,342

The above statement is a careful and conservative deduction based on experience. It shows very strikingly the advisability of not putting too much stress on first cost, but rather the adoption of a type that is long-lived, durable and of low maintenance cost.

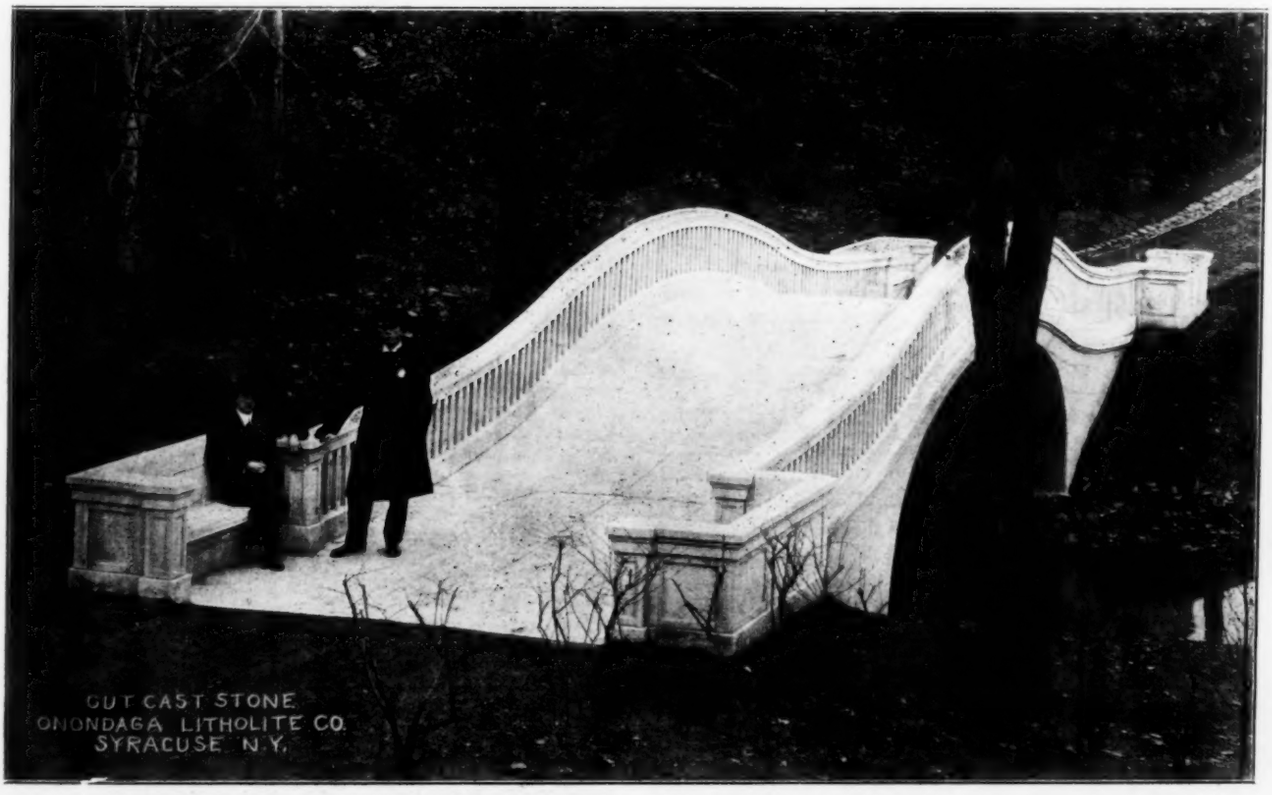
Concrete Keeps Money at Home.

Business men, supervisors and county boards or officials appreciate the value of using local labor and materials for all kinds of public improvements. This keeps the money in the community in which the structures are built. In the case of the concrete bridge, gravel, broken stone, sand, cement, lumber, teams and labor usually come from local sources, thereby quickening trade and stimulating local endeavor.

Concrete Increases Safety Factor.

Many well known engineers, in discussing future traffic, have stated the conviction that it is unwise to be conservative in view of the fact that intensity of traffic is increasing rapidly and the speed and wheel loads of vehicles becoming excessive. All informed opinion on the subject points toward concrete as the ultimate solution of the bridge problem.

CONCRETE FOR PERMANENCE.



Small, Graceful Park Bridge, Built by Essex Co. Park Commission, Monclair, N. J.

ADVERTISEMENT

Soluble Sizing Tallow

THIS PREPARATION is simply raw beef tallow made soluble. In view of the fact that raw tallow will not dissolve and hence does not combine with starches, we herein offer an article that avoids these objectionable features. Soluble Sizing Tallow dissolves and combines readily with all starches and acts as a most valuable softening agent. Users of this article will avoid the danger of mildewed warps and also the disagreeable odor of Raw Tallow in the goods. In short, an unexcelled softening agent.

Arabol Manufacturing Co.

100 William Street, NEW YORK CITY

Southern Sales Agent, CAMERON MacRAE, - Charlotte, N. C.

Gate City Cotton Mills

1209-10 Fourth National Bank Bldg.,

ATLANTA, GA.

Manufacturers of Superior Quality

RING SPUN

HOSIERY YARN

We Sell Direct to Knitters and Guarantee Satisfaction.

ALPHABETICAL INDEX TO ADVERTISERS

A

Aberfoyle Mfg. Co. 77
Acme Print Co. 89
Acme Steel Goods Co. 7
Allen Mfg. Co., The 28
Allis-Chalmers Mfg. Co..... 26
American Audit Co. 89
American Bond & Mortgage Co. 89
American Crayon Co. 28
American High Speed Chain Co. 14
American Machine Co., H & B 67
American Moistening Co. 6
American Soap and Washoline Co. 77
American Supply Co..... 87
American Textile Banding Co. Inc. 73
Arabol Mfg. Co. 82
Atlanta Stamp & Stencil Wks. 90

B

Barber-Colman Co. 6
Barber Mfg. Co. 75
Barrett Mfg. Co. 69
Bayer Co. 95
Beer, H. & B. 88
Bird-Wilcox Co., Inc. 23
Birmingham Slag Co. 79
Boomer & Boschert Press Co... 6
Boss Knitting Machine Works 11
Bosson & Lane 97
Boston Economy Lamp Div. .. 14
Bradley Mfg. Co., A. J..... 84
Brinton Co., H. 11
Bull, Wm. C. 7
Butterworth & Sons Co., H. W. 98

C

Carbondale Calcium Co. 77
Cary Mfg. Co. 9
Cassella Color Co. 96
Central of Georgia Railway.... 92
Clayton, J. M. 26
Clayton & Bentley Co. 5
Clinchfield Fuel Co. 16
Cole Bros 6
Connecticut Mill Supply Co.... 7
Corn Products Refining Co.... 13
Cortright Metal Roofing Co.... 75
Crompton & Knowles Loom Works 4
Curtis & Marble Machine Co... 12

D

Davis, Rogers W. 4
Davison Publishing Co. 19
Delahunty Dyeing Machine Co. 96
Detroit & Cleveland Navigation Co. 92
Diamond State Fibre Co. 73
Diener Mfg. Co., Geo. W..... 14
Dixon Crucible Co., Joseph.... 28
Dixon Lubricating Saddle Co.. 14
Dobbins Soap Co..... 77
Dowman-Dozier Mfg. Co..... 17
Draper Co. .....2 and 3
Dufur & Co. 14
Dunn & Krause 73

E

Economy Fuse & Mfg. Co..... 75
Electric Smelting & Aluminum Co. 75
Emmons Loom Harness Co.... 84
Erdle Perforating Co. 14
Eureka Fire Hose Mfg. Co.... 15

F

Farbwerke-Hoechst Co. 85
Fawcett, Hughes 88
Felton Brush Co., D. D. 28
Firsching, J. A. 75
Foster Engineering Co. 16

G

Garland Mfg. Co. 28
Gate City Cotton Mills 82
General Electric Co. 27
Georgia Railroad 93
Georgia School of Technology.. 73
Gibson Mfg. Co. 89
Graphite Lubricating Co. 26
Graton & Knight Mfg. Co. 1

H

Hausburg, E. O. 87
Hemphill Mfg. Co. 8
Henderson & Co., Chas. F. 88
Hill & Ferguson 90
Hotel Birmingham 88
Hotel Cawthon 92
Hotel Chelsea 91
Hotel Empire 91
Hotel Marseilles 92
Hotel San Carlos 92
Hotel Tuller 91
Hotel Van Rensselaer 90
Hotel Woodstock 91
Howe Mill Crayon Co. 73
Howard & Bullough American Machine Co. 67
Howard & Morse 15
Howard Clock Co., E.....100
Hubbard & Co. 7
Hungerford & Terry, Inc..... 14
Hunt Co., Inc., C. W. 16

I

International Pulp Co. 87

K

Keever Starch Co. 13
Kellogg & Co., E. H. 94
Kildust Co. 87
Klipstein & Co. 95
Koven & Bro., L. O.....100

L

Lanett Bleachery & Dye Wks.. 96
Leigh & Butler 88
Lewis, John D. 75
Lindsay, Hyde & Co. 7
Lombard Iron Wks. & S. Co.. 94

M

Mason Co., Robt. D..... 96
Matthews, Ph. D., J. Merritt.. 90
McMorran & Co., Edw. W..... 15
Merrow Machine Co. 8
Missouri Lamp & Mfg. Co..... 15
Morehead Mfg. Co. 18
Morris Machine Works 94

N

N. Y. & N. J. Lubricating Co.. 83
Norwood Engineering Co. 97
Nye & Tredick Co. 9

O

Oliver, A. M. 90

P

Palmer Co., E. I. 11
Pass & Seymour Co., Inc. 71
Paulson, Linkroum & Co. 88
Pearson, J. T. 12
Phila. Drying Machine Co....100
Phila. Textile Mchy. Co. 98
Philadelphia Textile School.... 89
Prest-O-Lite Co., Inc. 78
Putnam-Hooker Co. 88

R

Reliance Machine Works 6
Rice Dobby Chain Co. 12
Richardson & Co., Alonzo 89
Roberts & Son 73
Roessler & Hasslacher Chem. Co. 96

S

S. K. F. Ball Bearing Co....100
Saco-Lowell Shops 4
Salkeld & Bros., A. D..... 88
Sargent's Sons Corp. C. G..... 95
Searchlight Company, The 23
Schofield Co., Wm. 6
Schofield's Sons, J. S. 23
Schwartz & Co., L. H. A....100
Schwarz, Adolph M. 93
Scovell & Co., Clinton H..... 77
Seydel Mfg. Co. 86
Shambow Shuttle Co. 71
Sirrine, J. E. 90
Small, Hankin & Simms 26
Smith, Drum & Co..... 99
Solvay Process Co..... 95
Southern Coal & Coke Co. 16
Southern Railway 93
Southern Textile Exposition... 21
Spiker, W. C. 90
Stafford & Holt 11
Standard Oil Co. 18
Steel Heddle Mfg. Co. 83
Stuart-Howland Co. 90
Sykes & Co., Walter F. 94

T

Tennessee Power Co..... 24
Textile Finishing Mch. Co..... 99
Tolhurst Machine Works..... 97
Toomey, Frank, Inc. 87

U

United & Globe Rubber Mfg. Companies 15
U. S. Conditioning & Testing Co. 28
U. S. Hoffman Co. 8

W

Walker Roofing Co. 18
Walsh & Weidner Co. 73
Wedderburn, Alex J. 89
Weimar Bros. 89
Weller, Francis R. 90
Westinghouse Elec. & Mfg. Co.. 25
White Co., The 22
Whitinsville Spinning Ring Co.. 12
Whiton Machine Co., S. E... 94
Wildman Mfg. Co. 10
Wolf & Co., Jacques..... 94
Woodward, Baldwin & Co. 88